

Endangered Species Biological Assessment Report



DRAFT ENVIRONMENTAL IMPACT STATEMENT

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LIST OF ACRONYMS

ANF	Apalachicola National Forest
BEBR	Bureau of Economic and Business Research
BLM	Bureau of Land Management
BMP	Best Management Practices
BMU	Bear Management Unit
CCAA	Candidate Conservation Agreement Assurances
CFA	Core Foraging Area
CR	County Road
DE	Determination of Effects
DFIRM	Digital Flood Insurance Rate Maps
DOQQ	Digital Orthophoto Quarter-Quadrangle
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Element Occurrence
ERP	Environmental Resource Permit
ESBAR	Endangered Species Biological Assessment Report
EST	Environmental Screening Tool
ETAT	Environmental Technical Advisory Team
ETDM	Efficient Transportation Decision Making
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FFWCC	Florida Fish and Wildlife Conservation Commission
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FIS	Flood Insurance Studies
FLUCFCS	Florida Land Use, Cover and Forms Classification System
FMRI	Florida Marine Research Institute
FNAI	Florida Natural Areas Inventory
FS	Florida Statutes
FWS	Flatwoods Salamander
GCP	Gulf Coast Parkway
GIS	Geographic Information System
GPS	Global Positioning System
ICE	Indirect and Cumulative Effects
ICWW	Intracoastal Waterway

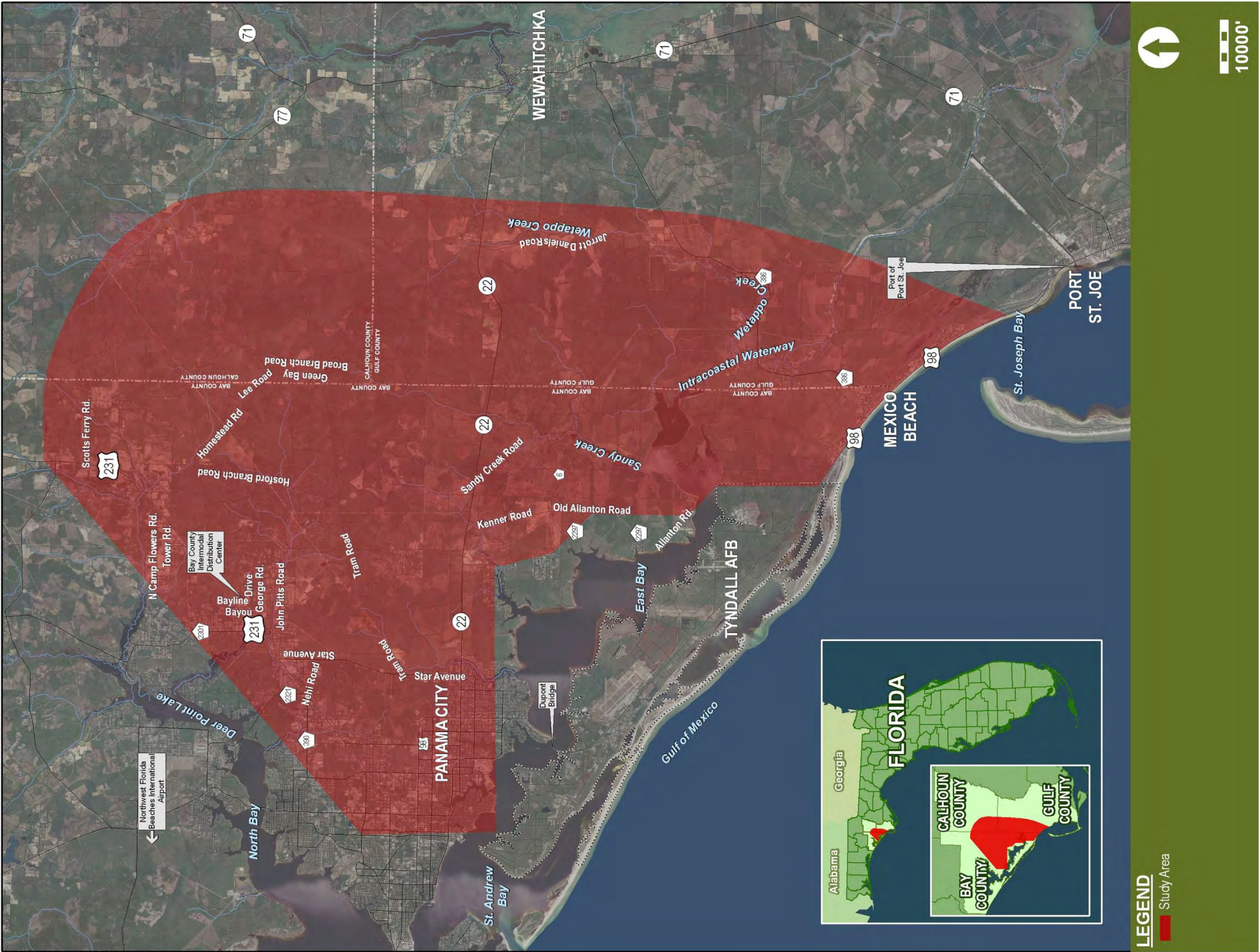
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IDC	Intermodal Distribution Center
LBMA	Lathrop Bayou Management Area
LOS	Level of Service
L RTP	Long Range Transportation Plan
MGD	Million Gallons per Day
MOU	Memorandum of Understanding
NAVD	North American Vertical Datum
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resource Conservation Service
NWFBIA	Northwest Florida Beaches International Airport
NWFWMD	Northwest Florida Water Management District
NWI	National Wetlands Inventory
PCC	Panama City Crayfish
PD&E	Project Development and Environment
RCW	Red-cockaded Woodpecker
RFS	Reticulated Flatwoods Salamander
RGB	Red, Green and Blue
SJBSBP	St. Joseph Bay State Buffer Preserve
SIS	Strategic Intermodal System
SR	State Road
SSURGO	Soil Survey Geographic
TAFB	Tyndall Air Force Base
TDM	Transportation Demand Management
T&E	Threatened and Endangered Species
TNC	The Nature Conservancy
TPO	Transportation Planning Organization
TSM	Transportation System Management
UMAM	Uniform Mitigation Assessment Method
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WCCA	Wetappo Creek Conservation Area
WER	Wetland Evaluation Report

SECTION 1 INTRODUCTION

The Federal Highway Administration (FHWA), in cooperation with the Florida Department of Transportation (FDOT), is considering the addition of a new link in the transportation network of the central Panhandle of Florida. This new link, known as the Gulf Coast Parkway, (GCP) would provide a connection between US 98 in Gulf County and US 231 and US 98 (Tyndall Parkway) in Bay County, Florida (**Figure 1-1**). The proposed roadway would use a combination of existing and new alignment within a 168-foot to 250-foot wide right-of-way. The right-of-way widths will allow for expansion of the road to a four-lane, divided roadway, when traffic demand warrants. In the rural areas the 250-foot right-of-way width will accommodate the construction of a 12-foot wide multi-use trail. In the urban areas a curb and gutter section with bike lanes and paved sidewalks will be constructed. The project length varies depending on the alternative alignment, but is generally between 30 and 33 miles long. In accordance with Section 7(c) of the Endangered Species Act of 1973 and the FDOT Project Development and Environment (PD&E) Manual Part 2, Chapter 27, an Endangered Species Biological Assessment was conducted for this project. Due to the potential involvement with federally protected species, informal consultations with the United States Fish & Wildlife Service (USFWS) were initiated.

Figure 1-1: Project Location and Study Area



SECTION 2 PROJECT DESCRIPTION

The FHWA, in cooperation with the FDOT, is considering the addition of a new link in the transportation network of the central Panhandle of Florida. This new link, known as the GCP, would provide a connection between US 98 in Gulf County and US 231 and US 98 (Tyndall Parkway) in Bay County, Florida. The purpose for the GCP is to:

- Enhance economic development in Gulf County through provision of direct access to major transportation facilities (regional freight transportation routes and intermodal facilities); improved mobility; and direct access to tourist destinations in south Gulf County.
- Improve mobility within the regional transportation network by providing a new connection to existing and future transportation routes consistent with the Bay County Long Range Transportation Plan (LRTP) and the Gulf County Comprehensive Plan.
- Improve security of the Tyndall Air Force Base (TAFB) by providing a shorter detour route.
- Improve hurricane evacuation for residents of coastal Gulf County by providing an additional evacuation route.

2.1 EXISTING FACILITIES

The proposed GCP is a new facility on a combination of existing and new alignments. The typical sections for existing roadways in the study area that may be utilized as part of the GCP alternatives are described below.

County Road (CR) 386 from US 98 south of Mexico Beach to Wetappo Creek is a two-lane rural undivided roadway with one 12-foot travel lane and a 5-foot grass shoulder in each direction, except in the area within approximately 1,200 feet on each side of the Intracoastal Waterway (ICWW) a bridge, where 12-foot travel lanes and 9-foot shoulders (with 4-foot paved) are provided. The roadway is centered within the existing right-of-way which has a minimum width of 100 feet.

State Road (SR) 22 from Star Avenue (CR 2315) to SR 71 in Wewahitchka is a two-lane rural undivided roadway with one 12-foot travel lane and a 12-foot shoulder (5-foot paved) in each direction. The roadway is centered within the existing right-of-way which has a minimum width of 100 feet.

US 98 south of CR 386 near Mexico Beach is a two-lane rural undivided roadway with one 12-foot travel lane and a 9-foot shoulder (5-foot paved) in each direction. The right-of-way north of the centerline varies from 30 to 100 feet, and the right-of-way south of the centerline varies from 33 to 64 feet. The speed limit for this roadway section is 35 mph.

US 98 (SR 30A/Tyndall Parkway) in Springfield is a four-lane urban divided roadway with two 12-foot travel lanes in each direction, separated by a 28-foot raised grass median. The roadway is centered within the existing right-of-way which has a minimum width of 80 feet. The speed limit for this roadway section is 45 mph.

US 231 in the vicinity of Star Avenue (CR 2315) and College Station is a four-lane rural divided roadway with two 12-foot travel lanes in each direction, separated by a 40-foot depressed grass median. The roadway has 8-foot inside shoulders and 10-foot outside shoulders (4-foot paved), and is centered within a right-of-way width of 224 feet. The speed limit for this roadway section is 55 mph.

Star Avenue (CR 2315) from SR 22 to US 231 is a two-lane rural undivided roadway with one 11-foot travel lane and a 5-foot grass shoulder in each direction. The roadway is centered within the existing right-of-way which has a width of 100 feet. The speed limit for this roadway section is 45 mph.

Tram Road (CR 101) from US 98 (SR 30A) to the Clifford Chester Sims State Veteran's Nursing Home facility approximately 1,500 feet east of US 98 is a two-lane rural undivided roadway with 12-foot travel lanes and 6-foot paved shoulders. The roadway is centered within the existing right-of-way which has a width of 100 feet. From approximately 1,500 feet east of US 98 to Star Avenue (CR 2315) Tram Road is an unpaved roadway. The speed limit for this roadway section is 35 mph.

Nehi Road extends from Star Avenue (CR 2315) to US 231 and is an unpaved roadway within these limits, except for the approximately 2,000 foot segment from the Bay County correctional facility to Cherokee Heights Road where the roadway has one 12-foot travel lane in each direction. The speed limit for this roadway section varies between 25 and 30 mph.

2.2 NEED FOR THE PROJECT

The need for the project arose initially from the depressed economic conditions in Gulf County, Florida. As the concept of improving the transportation network as an economic stimulus for the County was investigated, it became apparent that additional needs could be addressed by the proposed facility. These needs included the relief of congestion on existing roads within the network, improving the security of TAFB, and enhancing hurricane evacuation. In order to evaluate alternatives (discussed in Section 2) that would be proposed to satisfy these needs, objectives were developed for each need that would provide a measure of the success each alternative could be expected to achieve in addressing the project needs. The project needs and objectives are discussed below.

2.2.1 Enhance Gulf County's Economic Competitiveness

The need for economic development within the study area, and especially in Gulf County, has been made evident by the classification of Gulf County as a Rural Area of Critical Economic Concern. As a result of this classification, several organizations are in place to promote economic development activities in the northwest region of Florida. These include Opportunity Florida, Enterprise Florida, and Florida's Great Northwest, Inc. Each of these partnerships is focused on providing economic development initiatives and supporting activities that create economic advantages in the region; although, Opportunity Florida is more narrowly focused on those counties within the Northwest Florida Rural Area of Critical

Economic Concern: Calhoun, Franklin, Gadsden, Gulf, Holmes, Jackson, Liberty and Washington counties.

The GCP would also serve as a connection to strategic intermodal facilities throughout the region, such as the Northwest Florida Beaches International Airport (NWFBI), the Port of Panama City and the (future) Port of Port St. Joe, and the Bay County Intermodal Distribution Center (IDC), currently under construction.

2.2.1.1 Reduce Travel Times to Employment Centers in Bay County

The GCP would reduce travel times to employment centers in Bay County providing greater job opportunities for those residents of Gulf County that have suffered from the increased unemployment rates in the county. These employment centers largely reside in the Central Business District located in the downtown area of Panama City which is the largest municipality in the study area region.

2.2.1.2 Improve Access between Enterprise Zones and US 231

Among the efforts to improve economic conditions in Gulf County is the establishment of enterprise zones. An Enterprise Zone is an impoverished area in which businesses are exempt from certain taxes and are given other economic advantages as an inducement to locate there and employ residents. Within the project study area, enterprise zones have been designated along US 98 from south of the City of Port St. Joe to CR 386, and along CR 386 from US 98 to the Overstreet area. Improved access between these enterprise zones and US 231 provided by the GCP would encourage development in these areas and contribute to Gulf County's economic growth initiatives. Additionally, growth in both the Enterprise Zones as well as the other areas where the GCP is proposed through Gulf County is consistent with the county's future growth plans.

2.2.1.3 Provide a Direct Route from south Gulf County to US 231 and Freight Transfer Facilities in Bay County

The GCP would provide a direct connection from south Gulf County to US 231 and the freight transfer facilities at the Bay County IDC. The linkage provided by the GCP to the Bay County IDC would expand the variety of economic development opportunities that could occur in Gulf County and improve access to and from the Port of Port St. Joe, making it more attractive to potential users by expanding the available methods of distributing goods to markets.

2.2.1.4 Provide a More Direct Route from south Gulf County to the Northwest Florida Beaches International Airport

The New NWFBI is a part of Florida's Strategic Intermodal System (SIS). New roadways connecting to SIS facilities provide enhanced access to economic markets, thereby supporting economic competitiveness. Gulf County would benefit from the linkage provided by the GCP to the airport and other intermodal freight facilities because it would increase the access to goods being shipped via these locations. In addition, the Port of Port St. Joe would

become more attractive to potential users through improved connections to intermodal facilities via the GCP. In turn, this would provide Gulf County greater access to global markets.

2.2.1.5 Provide a More Direct Route for Tourists Traveling US 231 to south Gulf County

Gulf County must compete with Bay County for tourist dollars. Bay County has an estimated seven million people visit their beaches annually. Access to Gulf County beaches is mostly by US 231 to US 98 (Tyndall Parkway); then through the communities of Springfield, Callaway, and Parker; across the ICWW; and finally through the TAFB Reservation to the desired destination. An alternate but little used route is the two-lane SR 71 or SR 71/CR 386, depending on the destination. A new, more direct route bypassing the congested sections of US 231 and US 98 (Tyndall Parkway) and allowing for higher travel speeds would make the Gulf County beaches a more desirable destination.

The GCP will also provide a direct route to south Gulf County recreational resources along the coast. Additionally, the improved connection between the New NWFBIA and Gulf County would also make the coastal communities more accessible and appealing for tourists.

2.2.2 Improve Mobility and Connectivity within the Regional Transportation Network

The proposed project would provide a new link in the regional transportation network. GCP would connect with other regional transportation facilities, like Tyndall Parkway, and relieve congested segments of existing roadways, like US 98. GCP would also improve access within the region by providing connections to other regional facilities such as the Bay County IDC, the NWFBIA, The Eastern Shipyard, and the Port of Port St. Joe.

2.2.2.1 Reduce Congestion on the Tyndall Parkway (US 98)

The US 98 (Tyndall Parkway) north of the TAFB Reservation, currently operates at Level of Service (LOS) F, LOS C is the established accepted standard for this roadway. The addition of the GCP to the regional transportation network will benefit US 98 by providing an alternative roadway to relieve traffic congestion along this roadway and therefore improving the LOS at which the roadway currently operates. The GCP will also extend the time before improvements on the existing network are needed by transferring some of the through traffic to a new road with added capacity, providing a more balanced highway network.

2.2.2.2 Provide Future Traffic Capacity between south Gulf County and Bay County

Prior to 1990, Gulf County experienced slow, but steady population growth at a rate of around 6 percent. However, between the 1990 and 2000 census, Gulf County's population increased by 16.1 percent. Future population growth is projected to be even greater. The Bureau of Economic and Business Research (BEBR) at the University of Florida estimated that Gulf County's population increased approximately 22 percent from 2000 to 2004. The

United States Geological Survey (USGS) in Open-File Report 9, *Water use trends and demand projections in the Northwest Florida Water Management District* (1998), projects Gulf County's population to increase 36 percent between 2005 and 2020.

Florida's current growth management policy encourages local governments to be pro-active in planning for future growth and provide the necessary infrastructure needed to support the projected level of growth. In order to adequately prepare for the recent and anticipated growth and development along the Gulf Coast in Gulf County, improved access is needed between US 98 in Gulf County and US 231 in Bay County. The GCP would provide that access.

2.2.2.3 Provide a More Efficient US 98 Detour Route

There are a variety of scenarios that would require US 98 to be closed to through traffic. Should the DuPont Bridge be closed due to high winds or damage, the use of a detour would be required for a lengthy period of time. A 50-mile long detour is particularly onerous if made daily over a period of months. The GCP would provide a more efficient detour route, reducing the detour distance by potentially 30 miles.

2.2.2.4 Maintain Continuity with Planned Future Transportation Projects

The GCP should be consistent with the approved state and local comprehensive and transportation plans.

The proposed project has been developed to be consistent with existing transportation plans and planned projects. Since the project crosses planning jurisdiction boundaries, portions of the projects may only be included in some plans. Also, due to the project's length it is expected that the improvements would occur in phases. Therefore, in some transportation plans, only certain segments have been identified within the planning period of the specific plan. Other segments may occur later than the planning period, or may occur in another planning jurisdiction's plan.

2.2.3 Improve Security of the TAFB

US 98 is a major east-west roadway serving the Gulf Coast region. A large segment of US 98, between the City of Port St. Joe and Panama City, provides the only through route within this region and lies partly within the TAFB Reservation. When US 98 through TAFB is closed for any reason vehicles must travel a detour route approximately 50 miles long to reach their destination. The closing of US 98 is periodically necessary for security purposes at TAFB. Any time that a training drone is launched, US 98 is closed within one mile of the runway. TAFB will not release data on the frequency or timing of these launches for security reasons. There have also been past instances where accidents involving drone or plane crashes have required the closure of portions of US 98. Drone crashes occurred in November 1996 and again in February 2002, there was a plane crash at TAFB in March 2003. An alternate route to US 98 in the Callaway/Springfield area would benefit both the TAFB and the traveling public who would not have to travel an approximately 50 mile detour to reach their destination.

TAFB submitted a letter indicating that the project would benefit security at the base by providing a suitable alternative route for the public. TAFB indicated this would significantly upgrade its force protection posture and the safety and security of its personnel and resources, as well as enhance its ability to execute its mission in heightened threat conditions.

2.2.4 Improve Hurricane Evacuation Capability

Recent hurricane seasons have demonstrated the need for improved evacuation (and recovery) routes and additional route options to accommodate area residents and visitors, particularly in Gulf County where there are limited evacuation routes. US 98 is not an acceptable hurricane evacuation route, as it is within the surge zone for a Category 3, or greater, hurricane through most of the corridor. The east-west orientation of US 98 does not promote efficient evacuation for residents of coastal communities who are usually traveling north to seek safe shelter. Evacuation on US 98 through TAFB is further complicated by the DuPont Bridge, which is a high-level bridge that must be closed once winds reach 55 mph. The closure of the bridge forces drivers to travel east on US 98 for long distances before they are able to turn north and out of the hurricane surge zone areas.

In the event of an evacuation, Bay County is served by northbound SR 231, SR 77, and SR 79. Those needing to evacuate Gulf County are served by CR 386 and SR 71. From CR 386, residents must travel SR 71 to Wewahitchka. From there, they either remain on the two-lane SR 71 or take SR 22 west to US 231. Although the coastal areas in Gulf County are lightly populated at this time, projected future development and corresponding population growth in the area, as discussed in Section 3.3.2, intensifies the need for improved evacuation routes. The GCP would provide an alternate hurricane evacuation route for the coastal communities and it would enhance the ability of rescue and recovery vehicles to access the area after the storm has passed.

SECTION 3 PROJECT ALTERNATIVES

FDOT has established engineering, environmental, economic and public acceptance goals for the identification of potential alternatives for improving transportation facilities. These goals can be summarized as follows:

- **Engineering:** Improve mobility by reducing travel time, congestion, and improving safety.
- **Environmental:** Preserve, protect, and enhance the natural, physical, cultural, and social environment.
- **Public Acceptance:** Produce a plan that is supported by the public, elected officials, and relevant agencies and that is consistent with the adopted transportation goals.
- **Economic:** Produce cost-effective improvements that assure the overall benefits warrant the overall costs.

No Build, Transportation Demand Management (TDM), Multi-modal, and Build alternatives were each evaluated considering the aforementioned goals. The alternatives are described below.

3.1 NO BUILD ALTERNATIVE

The No-Build Alternative would simply leave the existing roadway network in its current configuration. No capacity, intersection, pedestrian, bicycle, or safety improvements would be implemented within the corridor.

The No-Build Alternative has a number of positive attributes. No expenditure of public funds for design, right-of-way acquisition, or construction would be required. Traffic would not be disrupted due to construction, thus avoiding inconveniences to local businesses and residences. There would be no impacts to wetlands or threatened or endangered species. With the No-Build Alternative, there is no further risk of contamination. No costs would be incurred due to utility relocation. There would be no direct or indirect impacts to the socioeconomic characteristics, community cohesion, or system linkage of the area.

However, the No-Build Alternative option fails to fulfill the project's purpose and need, or meet any of the Bay or Gulf County Comprehensive and LRTP. The lack of a new roadway would not:

- Help reduce travel time for residents from southeast Bay and coastal Gulf Counties to employment centers in Panama City;
- Provide a more direct route between US 98 in Gulf County and freight transfer facilities on US 231 in Bay County;
- Improve access to Enterprise Zones in Gulf County;

- Provide a direct route for tourists traveling US 231 to reach vacation and recreation areas in south Gulf County;
- Provide a more direct route from south Gulf County to the new NWFBIA;
- Help ease traffic congestion on the surrounding roadway network, including US 98 (Tyndall Parkway) through Bay County;
- Provide an alternative route to US 98 (Tyndall Parkway) in Bay County to US 98 in Gulf County that does not travel through TAFB; or
- Provide an alternative emergency and hurricane evacuation route.

The No-Build Alternative is also inconsistent with the plans and goals of the Bay County Transportation Planning Organization (TPO). It fails to comply with the LRTP as established by the TPO.

However, the No-Build Alternative will remain a viable alternative throughout the entire length of the study along with the Build Alternatives.

3.2 TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVES

Transportation System Management (TSM) alternatives include those activities that maximize the efficiency of the existing system. Possible options include ride-sharing, fringe parking, the addition of turn lanes, traffic signal timing optimization, and access management measures. While TSM options will be incorporated into the proposed project to the greatest extent possible, TSM improvements alone would provide little to no contributions to meeting the project's purpose and need. Much like the No-Build Alternative, the TSM alternative fails to fulfill the needs and goals of the Bay and Gulf County Plans. For all of these reasons, no TSM alternative was considered as a solution for the existing and expected deficiencies to the GCP corridor.

3.3 MULTI-MODAL ALTERNATIVES

Multi-modal solutions to substandard roadways are generally only effective within highly urbanized or constrained corridors. Specific examples of multi-modal alternatives are mass transit systems such as bus or rail options.

Multi-modal options usually serve to move people and since the project study area is mostly rural, there is insufficient population to support multi-modal facilities. Further, multi-modal alternatives do not address the need to improve the economic climate within the study area and multi-modal facilities are inconsistent with the needs and goals of the Bay County 2030 LRTP and the Bay and Gulf County Comprehensive Plans. For all of these reasons, no multi-modal alternative was considered as a solution for the existing and expected deficiencies to the GCP corridor.

3.4 BUILD ALTERNATIVES

The proposed typical section for the Build Alternatives in the design year (2032) is a four-lane divided roadway with stormwater management and bicycle and pedestrian facilities. The configuration of the typical section depends upon its location. The rural arterial typical section includes four 12-foot lanes with a five-foot outside shoulder and two-foot inside shoulder, separated by a 64-foot median in 250 feet of right-of-way. Included in the rural arterial typical section is a 12-foot paved multi-use trail to one side (**Figure 3-1**). The four-lane high-speed urban arterial section includes four 12-foot lanes with 6.5-foot bicycle lanes in the outside shoulders and four-foot paved inside shoulders, separated by a 46-foot median in 168 feet of right-of-way. This is a curb and gutter section with five-foot paved sidewalks on each side of the roadway (**Figure 3-2**). The bridge typical sections are shown in **Figures 3-3 and 3-4**.

Initially, the project will require only two 12-foot lanes within either typical section; however, the additional right-of-way is being obtained in order to provide for future expansion when needed. The proposed design speed is 65 mph for the rural roadway, and 50 mph for the urban roadway.

Five build alternative alignments have been identified for consideration. These five alignments, Alternatives 8, 14, 15, 17, and 19, are shown in **Figure 3-5** and are described in **Table 3-1**. For a summary of the alternatives development process please refer to Section 2 of the Draft Environmental Impact Statement (EIS).

Figure 3-1: Proposed Rural Arterial Typical Section

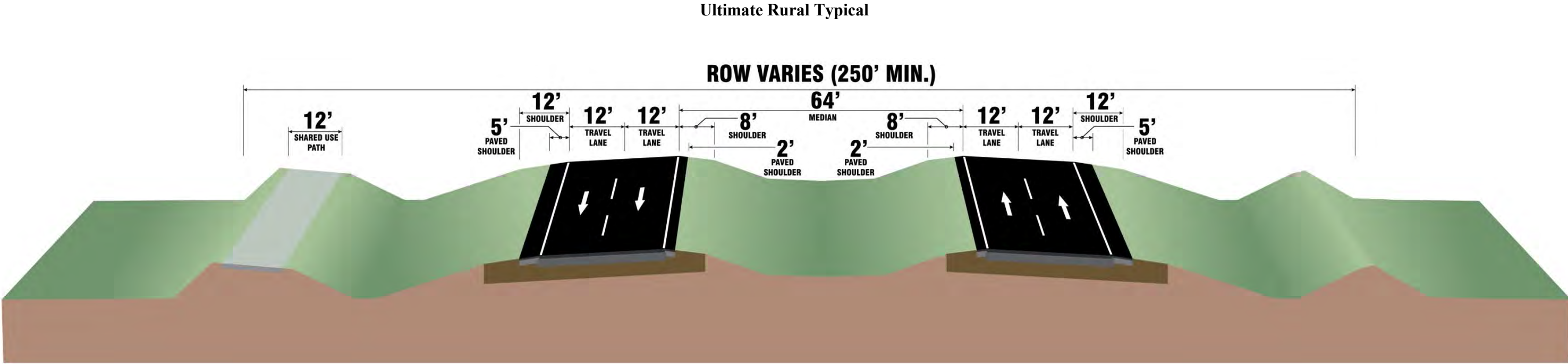
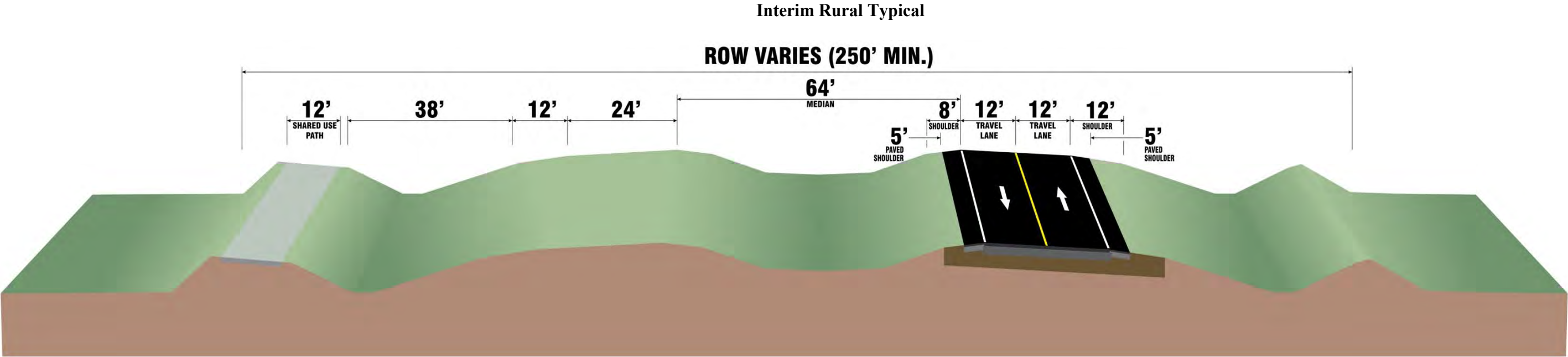
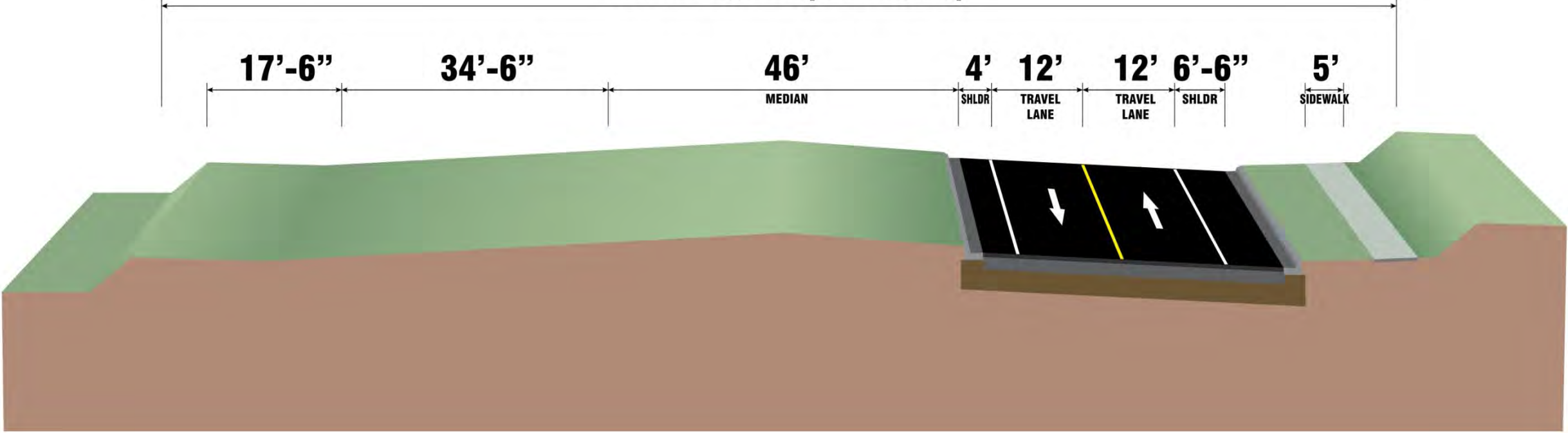


Figure 3-2: Proposed Urban Arterial Typical Section
Interim Urban Typical
ROW VARIES (160' MIN.)



Ultimate Urban Typical
ROW VARIES (160' MIN.)

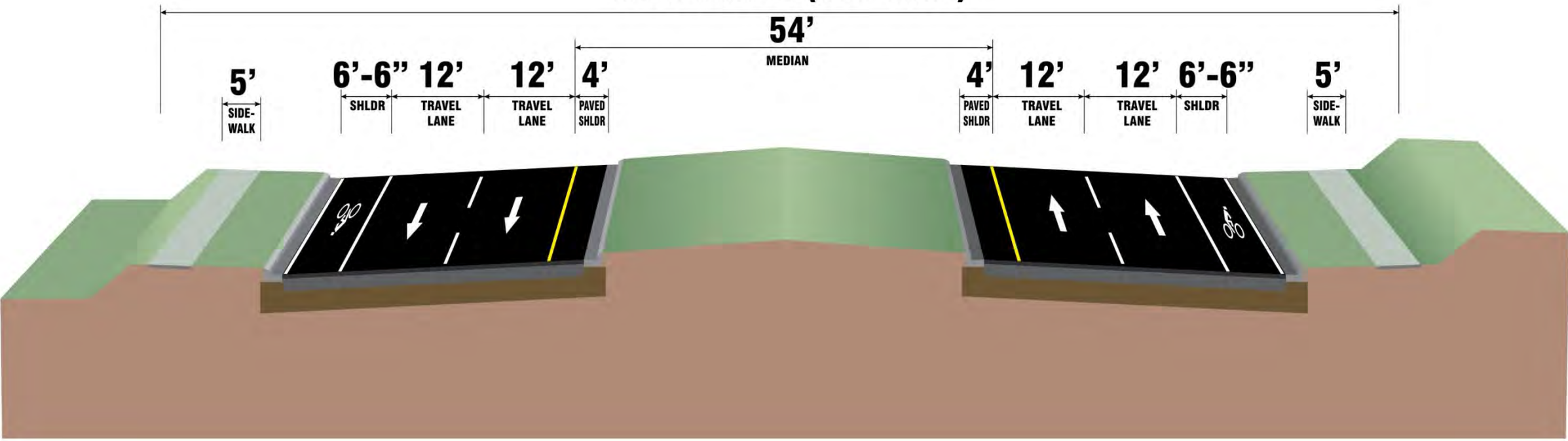


Figure 3-3: Proposed Interim Bridge Typical Sections

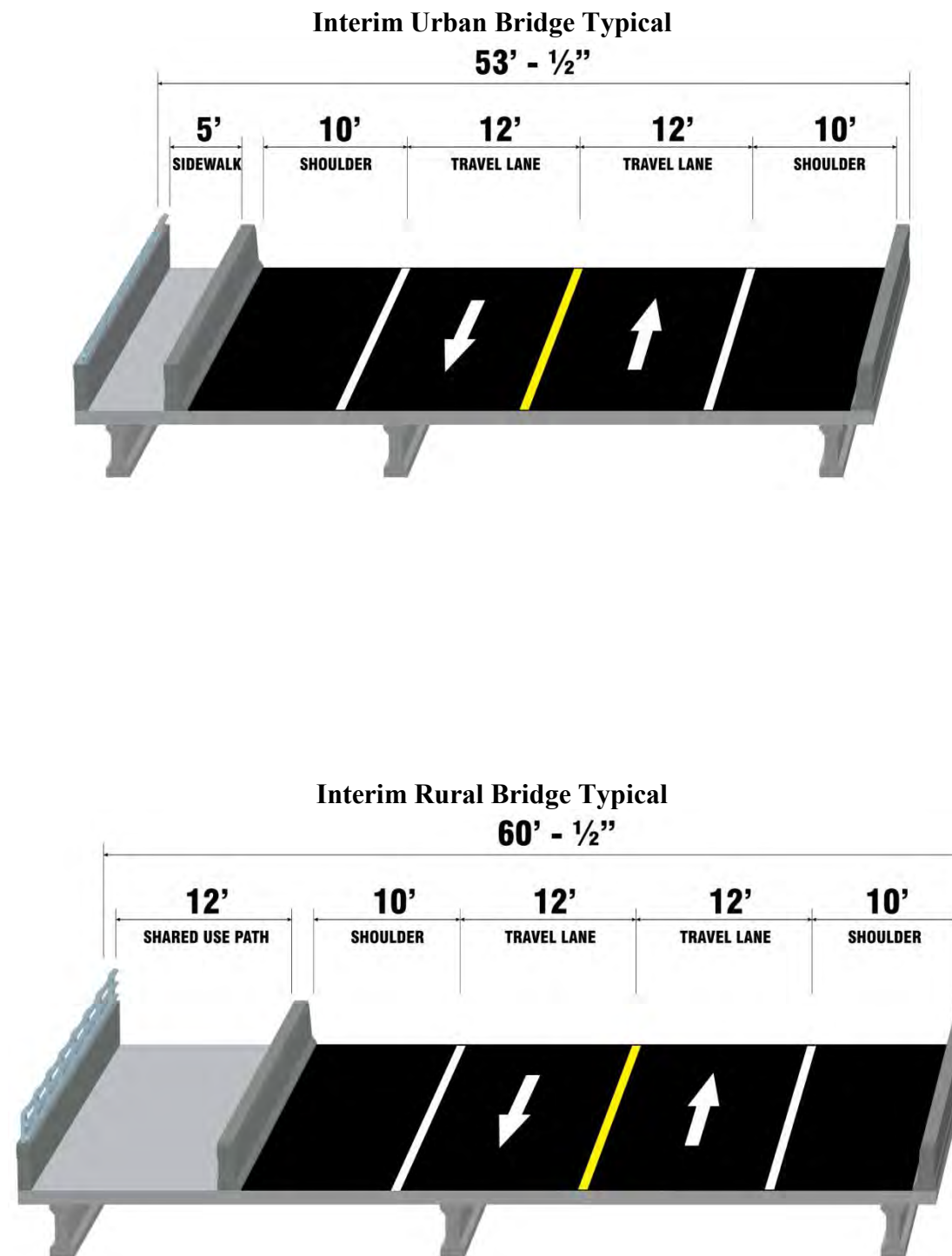


Figure 3-4: Proposed Ultimate Bridge Typical Sections

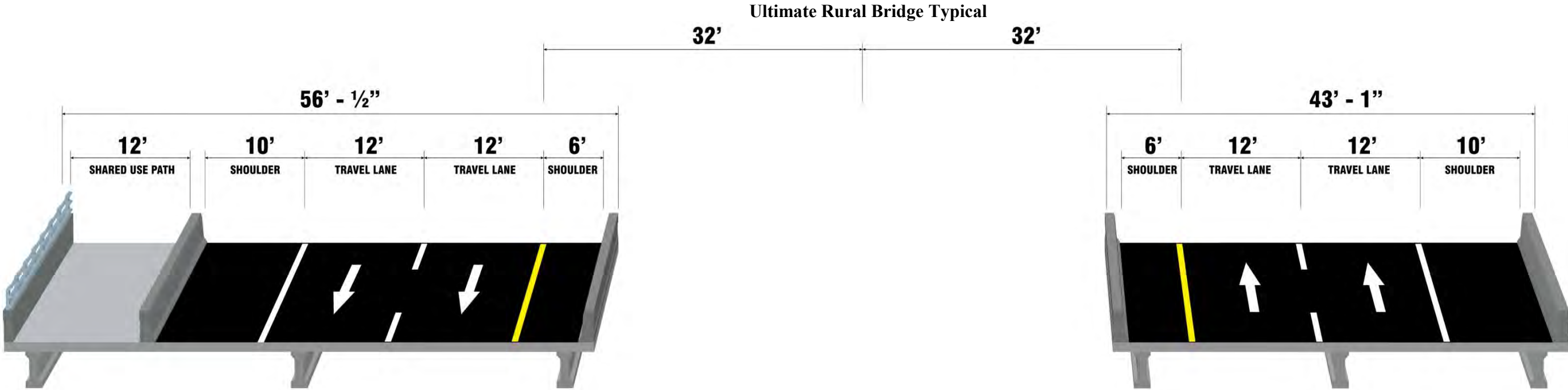
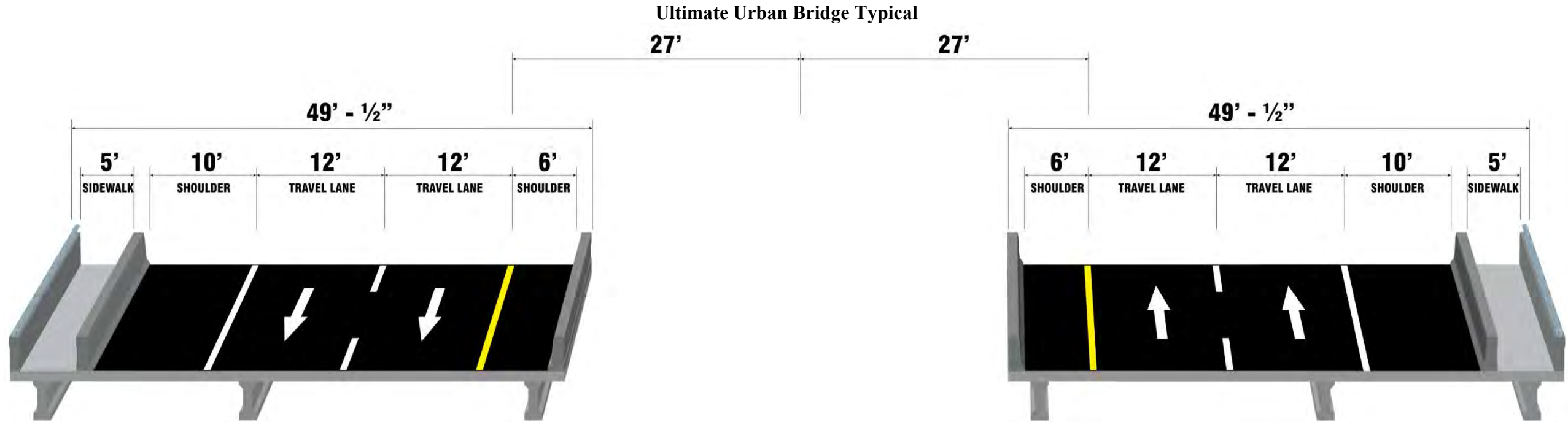


Figure 3-5 Gulf Coast Parkway Build Alternatives



Table 3.1: Description of the Gulf Coast Parkway Build Alternatives

Alternative	Description
8	<p>From the intersection of US 98 and CR 386, Alternative 8 follows CR 386 north utilizing the urban typical section to North 15th Street. From there it transitions to a rural typical section, continuing north along existing CR 386 for approximately 3 miles where it deviates from CR 386. Proceeding north on new alignment for a total of approximately 8.5 miles, Alternative 8 crosses the ICWW and Wetappo Creek on a new high-level bridge, and continues north to intersect SR 22 approximately 11.4 miles east of Callaway. From there the alignment travels west along existing SR 22 for approximately 6.5 miles where it turns northwest and then west on new alignment for approximately 5.0 miles to intersect Star Avenue about 0.3 mile south of Tram Road. From Star Avenue, Alternative 8 transitions to an urban typical section which is carried through to both termini locations. The alternative's through movement continues west on new alignment for approximately 0.7 mile to merge with and follow existing Tram Road for approximately 0.5 mile. It then turns west and continues on new alignment to end at a new intersection with US 98 (Tyndall Parkway). Additionally, the less dominant leg of Alternative 8 proceeds north along existing Star Ave. approximately 2.2 miles until the intersection with Nehi Road where it follows mostly along Nehi Road to the northwest to end at a new intersection with US 231 in the vicinity of the existing CR 2321/US 231 intersection.</p>
14	<p>From the intersection of US 98 and CR 386, Alternative 14 follows CR 386 north utilizing the urban typical section to North 15th Street. From there it transitions to a rural typical section, continuing north along existing CR 386 for approximately 3 miles where it then deviates from CR 386 alignment. Proceeding north on new alignment for a total of approximately 8.5 miles, Alternative 14 crosses the ICWW and Wetappo Creek on a new high-level bridge, and continues north to intersect SR 22 approximately 11.4 miles east of Callaway. From there the alignment travels west along existing SR 22 for approximately 2.5 miles where it splits. To connect with US 98 (Tyndall Parkway), the alignment continues west on SR 22 for approximately 4.0 miles where it turns northwest and then west to intersect Star Ave. about 0.3 mile south of Tram Road. From Star Ave., Alternative 14 transitions to an urban typical section and continues west 0.7 mile to merge with and follow existing Tram Road for approximately 0.5 mile. It then turns west and continues on new alignment to end at a new intersection with US 98 (Tyndall Parkway). To connect with US 231, Alternative 14 after splitting from SR 22 proceeds northwest on new alignment for approximately 8.0 miles where it turns to the west and continuing on new alignment, travels south of and parallel to the Port of Panama City IDC and Conservation Boundary. It then transitions to an urban typical section and proceeds northwest to intersect with the planned entrance roadway for the IDC which intersects with US 231.</p>
15	<p>From the intersection of US 98 and CR 386, Alternative 15 follows CR 386 north utilizing the urban typical section to North 15th Street. From there it transitions to a rural typical section, continuing north along existing CR 386 for approximately 3 miles where it then deviates from the CR 386 alignment. Proceeding north, on new alignment for a total of approximately 8.5 miles, Alternative 15 crosses the ICWW and Wetappo Creek on a new high-level bridge, and continues north to intersect SR 22 approximately 11.4 miles east of Callaway. From there Alignment 15 has two options depending on the desired terminus. To connect with US 98 (Tyndall Parkway), Alternative 15 travels west along existing SR 22 for approximately 6.5 miles where it turns northwest and then west on new alignment for approximately 5.0 miles to intersect Star Ave. about 0.3 miles south of Tram Road. From Star Ave., Alternative 15 transitions to an urban typical section and continues west on new alignment for approximately 0.7 mile to merge with and follow existing Tram Road for approximately 0.5 mile. It then turns west and continues on new alignment to end at a new intersection with US 98 (Tyndall Parkway). Alternately, from SR 22, Alternative 15 continues across SR 22, traveling north then northwest on new alignment for approximately 14.0 miles, transitioning back to an urban typical section just before it ends at a new intersection with US 231 near Campflowers Road.</p>

Alternative	Description
17	<p>From the intersection of US 98 and CR 386, Alternative 17 follows CR 386 utilizing the urban typical section to North 15th Street. From there, it transitions to a rural typical section and continues north along existing CR 386 for approximately 0.5 mile where it then turns west and travels on new alignment for 3.0 miles. The alignment veers to the north for approximately 2.5 miles and then utilizing a new high level bridge crosses over East Bay and the ICWW. The alignment returns to grade on Allanton Point and continues to the north mostly along existing Allanton/Old Allanton Road until it reaches SR 22. After crossing SR 22, the road would travel north then west on new alignment for approximately 5.3 miles to connect at an intersection with Star Ave. about 0.3 mile south of Tram Road. From the intersection at Star Ave., Alternative 17 transitions to an urban typical section and has two termini locations. The alternative's through movement continues west on new alignment for approximately 0.7 mile until it merges with existing Tram Road. From there it travels along existing Tram Road for approximately 0.5 mile and then turns to the west on new alignment to end at a new intersection with US 98 (Tyndall Parkway). Additionally, the alternative travels north along existing Star Ave. approximately 2.2 miles until the intersection with Nehi Road where it follows mostly along Nehi Road to the northwest to end at a new intersection with US 231.</p>
19	<p>From the intersection of US 98 and CR 386, Alternative 19 follows CR 386 utilizing the urban typical section up to North 15th Street. From there it transitions to a rural typical section and continues north along existing CR 386 for approximately 0.5 mile where it then turns west and travels on new alignment for approximately 3.0 miles. The alignment veers to the north for approximately 2.5 miles and then, utilizing a new high level bridge crosses over East Bay and the ICWW. The alignment returns to grade on Allanton Point and continues to the north mostly along existing Allanton/Old Allanton Road until it reaches SR 22. After crossing SR 22, the road has two options. One would turn west to travel on new alignment for approximately 5.0 miles to intersect with Star Ave. about 0.3 miles south of Tram Road. From the intersection at Star Ave., Alternative 19 transitions to an urban typical section, continues west 0.7 mile to merge with and follow Tram Road for approximately 0.5 mile and then turns to the west on new alignment to end at a new intersection with US 98 (Tyndall Parkway). Alternately, Alignment 19 would continue north on new alignment for approximately 6.2 miles where it turns to the west, continuing on new alignment along the south property line of the Port of Panama City IDC and its Conservation Boundary. It then transitions to an urban typical section and turns to the northwest to intersect with the planned entrance roadway for the IDC which intersects with US 231.</p>

3.5 EVALUATION OF ALTERNATIVES

The evaluation of alternatives involved a comparative evaluation of each alternative's involvement with the socioeconomic, cultural, natural, and physical environments of the study area. The selection of datasets for inclusion in this analysis was accomplished through coordination with the Environmental Technical Advisory Team (ETAT) and particularly the cooperating agencies for this study. Most data identified by the cooperating agencies are Geographic Information System (GIS) desktop level information. However, the data for sensitive resources such as wetlands, listed and endangered species, noise, contamination, cultural and historic impacts, as well as right-of-way and relocation information, were all field-evaluated.

Because of the large number of issues involved and the variation in the alternatives' alignments, some alternatives avoid impacts better than others for one specific issue while performing worse in regards to a different issue, making the evaluation of alternatives complex and the justification for the selection of a particular alternative difficult. Therefore, a methodology for quantifying an alternatives performance so that it could be compared to other alternatives was developed.

The results of the alternatives comparative analysis will be presented to the public at a public hearing after which a recommendation for a preferred alternative will be made. The selection of a preferred alternative will be made in conjunction with the FDOT and FHWA and will take into consideration the comparative analysis of the alternatives' direct effects on the socioeconomic and natural environment, the results of the Indirect and Cumulative Effects (ICE) analysis of the project effects, and input from the public and the resource agencies. The selection of the preferred alternative will be documented in the Final EIS.

FDOT RECOMMENDED ALTERNATIVE

Based on the comparative analysis of all alternatives (as discussed in detail in Section 2.7.7 of the EIS), the build alternative that performed the best was Alternative 17.

Under species involvement, Alternative 17 and 19 had the least number of bear kills, but Alternative 17 had the most involvement with field surveyed protected species and, with Alternative 8, had the most involvement with the Panama City crayfish habitat. Alternative 17 was ranked third for involvement with wetlands, but was ranked, along with Alternative 19, first for involvement with EFH. Alternative 17 was second, after the No Build alternative, for involvement with floodplains, verified impaired waters, and named waterway crossings, but was fourth in involvement with Class 1 surface waters drainage basins.

Under the physical environment, Alternative 17 was second, after the No Build Alternative for involvement with utilities, and, along with Alternative 8, was first for involvement with railroads, it ranked sixth for involvement with contamination sites (which may be somewhat misleading since it would have involvement with only two sites), and it was second with Alternative 19, after the No Build Alternative in the number of noise sensitive sites it would potentially impact.

Alternative 17 was also ranked second, after the No Build alternative for the number of relocations it would cause. None of the alternatives would have involvement with conservation areas, cultural resources, or community facilities.

Estimated Costs Evaluation Category

This evaluation category compared the right-of-way, mitigation and construction costs of the alternatives. As would be expected, the No Build alternative performed best, because there were no costs associated with this alternative. This does not consider the costs of programmed improvements that would occur under the No Build alternative but might be delayed were the Gulf Coast Parkway constructed. Nor does it estimate the cost benefits of the Gulf Coast Parkway that would be lost if the Gulf Coast Parkway were not constructed. Of the Build alternatives, Alternative 8, at \$501.20 million, was the least expensive alternative followed by Alternative 17, at \$518.89 million. A difference of only 3.4 percent.

Public Preference Evaluation Category

The public preference evaluation category evaluated the public's expressed preferences, based on 533 responses to a questionnaire (discussed in Section 5 of the EIS) about the project. Based on these responses, Alternative 17 with 287 votes was overwhelmingly the preferred alternative although all alternatives, including the No Build, received votes expressing support. The second most favored alternative was Alternative 8 with 69 votes. There were 14 votes for the No Build alternative, 67 votes for Alternative 14, 22 votes for Alternative 15 and 17 votes for Alternative 19.

Alternatives Overall Performance and FDOT Recommendation

After completion of the evaluation of the alternatives in each of the four evaluation categories, Alternative 17 performed best in the Purpose and Need and Public Preference categories, was second in the Environmental Involvement Category, and third in the Cost Evaluation Category. Overall it was the top performing alternative.

At this point in time, based on existing public input, early agency coordination, engineering information and environmental studies, which are available for public review, Alternative 17 is currently considered the FDOT recommended alternative. However, FDOT will not make a final recommendation to FHWA on any alternative until all alternative impacts and comments on the EIS and public input resulting from the public hearing have been fully evaluated.

SECTION 4 EXISTING ENVIRONMENTAL SETTING

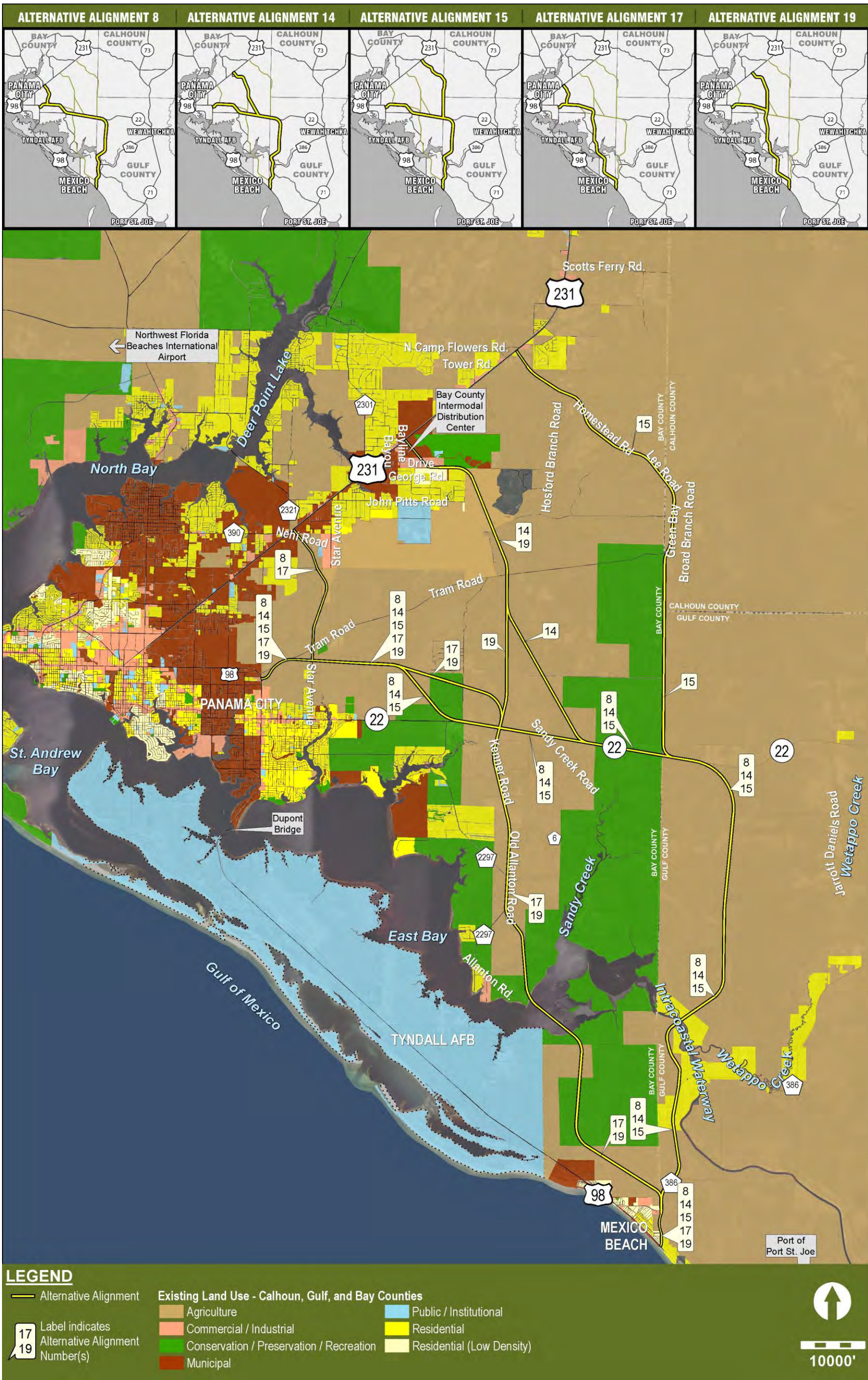
This section describes the existing land uses, natural and biological features of the project area.

4.1 LAND USE

The Existing Land Use Map for Gulf and Bay County, provided in **Figure 4-1**, is a composite of the existing land use maps for both counties. Due to the large study area for the GCP, a variety of existing land uses is encountered. Beginning at the southern terminus of the project, the land uses are a mix of commercial and residential. These land uses predominate northward through the Overstreet area. From CR 386 north to SR 22 and along SR 22 to the Star Avenue area, the land use is predominantly agricultural. From Star Avenue west, the land use is residential and then transitions to commercial as SR 22 approaches US 98. Following Star Avenue north of SR 22, the land use begins as agricultural, transitions to residential, and in the vicinity of US 231 becomes commercial. At the southernmost portion of US 231, there is a blend of commercial and residential land uses, along with a parcel of industrial land use. Continuing northward on US 231, the land use shifts to agricultural use up to Scotts Ferry Road, with small portions of residential and commercial land uses. From Scotts Ferry Road east, the land use is dominated by agricultural use which includes timberlands and several farms. The agricultural land use is consistent as it approaches SR 22 and through the Jarrott Daniels Road to the Overstreet area.

Future land uses for Gulf and Bay County are shown on **Figure 4-2**. Gulf County did not provide any data for future land use, although the County did state that the majority of the land use would not differ from the existing land use.

In Bay County, an area along the northern half of Star Avenue extending as far west as Jetton Lane and as far north as Johnny Lane is designated City Incorporated (Panama City). Within this area, along John Pitts Road, the land use is residential except for a large area of recreation and public/institutional land uses south of John Pitts Road at Old Majette Tower Road. A majority of the land use in Bay County will remain unchanged from its existing status.



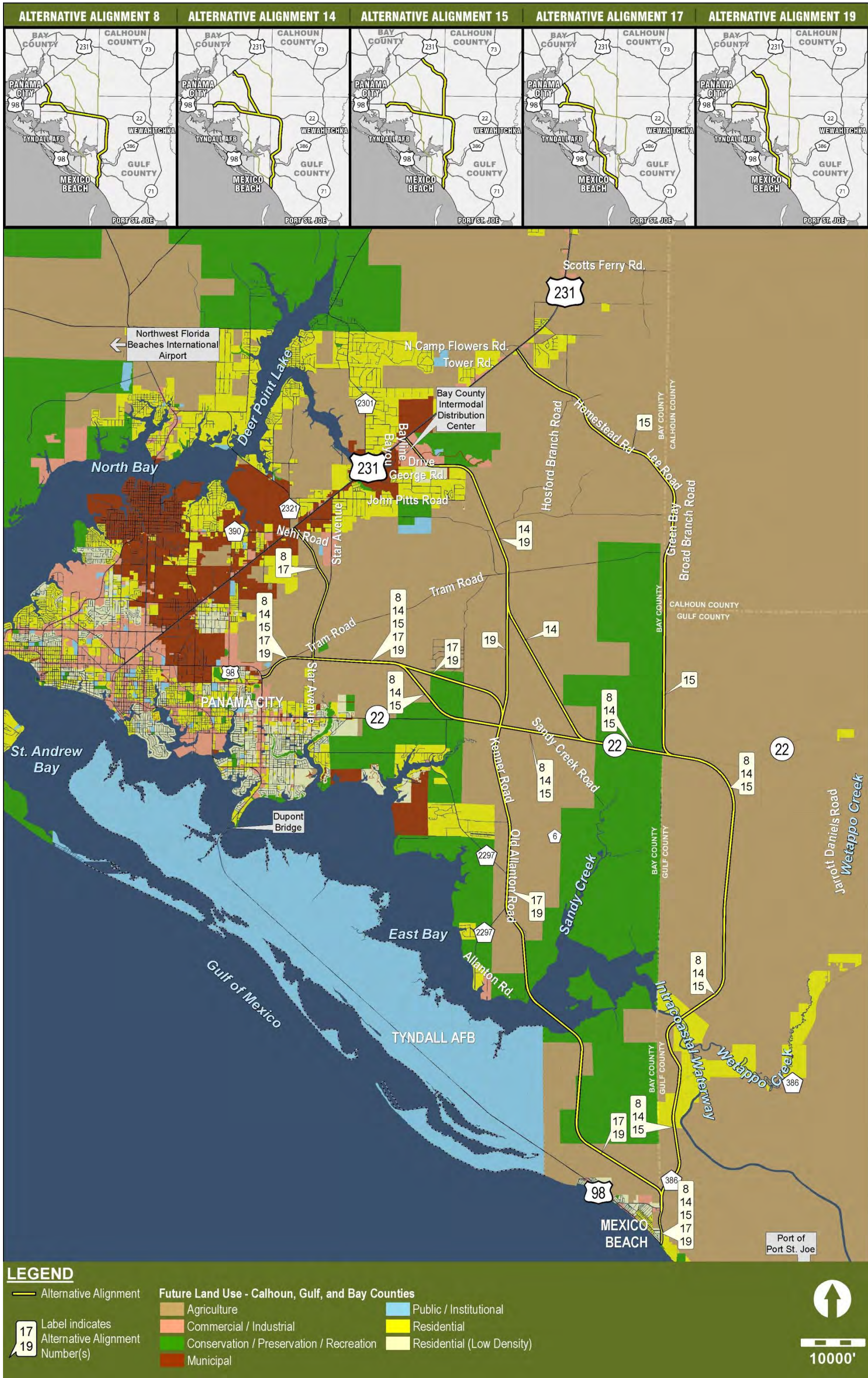


Figure 4-2: Gulf and Bay County Future Land Use Map

4.2 NATURAL AND BIOLOGICAL FEATURES

4.2.1 Physiographic Setting

The areas of Bay, Gulf and Calhoun Counties located within the project area are in the Coastal Plain province and have one physiographic region, the terraced Coastal Lowlands. The Coastal Lowlands occupy the entire periphery of the state and generally are areas of low elevation along the coasts (typical below 30 meters) that have a generally flat topography and are dominated by flatwoods ecosystems. Soils within the region are generally sandy and range from excessively drained in the upper regions to poorly drained in the lower elevations. Historically, fishing, forestry, and recreational uses have comprised the main industries in the region and a majority of the project study area continues to be dominated by silvicultural activities.

The study area is located in the St. Andrews Bay watershed, which is the only major watershed in the Florida panhandle that lies entirely in Florida (Florida Department of Environmental Protection {FDEP}, 2006). It includes Deer Point Lake Reservoir, St. Joseph Bay and the interconnected St. Andrews proper and East, West and North Bays.

The Gulf of Mexico and East Bay are the dominant and defining natural features within or adjacent to the study area. Alternative Alignments 17 and 19 would involve spanning East Bay, which is the eastern portion of the St. Andrews Bay estuarine system. East Bay and its tributaries are classified as a Class II Shellfish Propagation or Harvesting area. This designation means that oysters and other shellfish can be harvested in these waters. The standards for Class II water bodies pay particular attention to those components that affect the quality of the shellfish harvested in the area to protect consumers from possible diseases associated with the consumption of raw or cooked shellfish. The St. Andrews Bay estuary contains significant areas of seagrass, saltmarsh and tidal flat communities which are discussed in further detail within the Essential Fish Habitat Assessment (EFH) contained within the GCP Wetland Evaluation Report (WER).

The St. Andrews Bay watershed includes a number of streams and freshwater creeks that are located within the study area. The majority of these systems within the study area are hydrologically connected to either East Bay to the south or to Deer Point Lake to the west. The major freshwater creeks entering East Bay are those entering Calloway Bayou, Cooks Bayou, Laird Bayou and Sandy Creek. The primary streams with involvement in the study that enter Deer Point Lake are Bayou George Creek (Alternative Alignments 14 and 19) and the South Fork Bear Creek (Alternative Alignment 15).

Named waterbodies that will have direct involvement with Alternative Alignments are presented in Table 4.1 and shown in Appendix A, Figure 1.

Table 4.1
Named Waterbodies Crossed by the Alternative Alignments

Named Waterbodies and Stream Crossing	Alignment				
	8	14	15	17	19
Bayou George Creek and Tributaries		YES			YES
South Fork Bear Creek Tributaries			YES		
Bear Swamp	YES	YES	YES	YES	YES
Beefwood Branch		YES			YES
Big Branch		YES			YES
Callaway Creek and Tributaries	YES	YES	YES	YES	YES
Cooks Bayou and Tributaries	YES	YES	YES	YES	YES
Cushion Creek	YES	YES	YES	YES	YES
Cypress Creek	YES	YES	YES	YES	YES
East bay				YES	YES
Gude Branch	YES	YES	YES		
Horseford Branch			YES		
Horseshoe Creek and Tributaries	YES	YES	YES		
Island Branch		YES			YES
Joe Lamb Branch	YES	YES	YES		
Little Sandy Creek and Tributaries	YES	YES	YES		
Olivers Creek	YES	YES	YES		
Panther Swamp	YES	YES	YES	YES	YES
Sandy Creek and Tributaries	YES	YES	YES		
South Fork Bear Creek and Tributaries			YES		
Wetappo Creek	YES	YES	YES		

The majority of named waterbodies within the project area consist of streams which can be best described as blackwater streams. These systems typically emerge from wetlands, mostly bogs, hydric flatwoods and swamps, which release accumulated rain into stream channels. Blackwater streams are also characterized by relatively low flows, slow velocities, and low gradients. These streams are also acidic due to the high amounts of tannin and humic acids which darkly color the water resulting from decaying organic matter in the flatwoods and swamps. Submerged vegetation is limited due to the highly colored and acidic water, which limits light penetration. Blackwater rivers may carry high sediment loads during high flow events. Temperatures and volumes fluctuate with seasons and rainfall events. Stream beds are typically sandy with a thin layer of detritus, sometimes underlain by limestone, which may form outcrops in places. Some of the streams or their tributaries within the project area may be crossed more than once by the Alternative Alignments. In addition, some of the creeks crossed are tributaries to larger named streams that are also crossed. For example, Island

Branch and Big Branch are tributaries to Bayou George Creek which is a Class I water body. Likewise, Horseshoe Creek is a tributary to Bear Creek, which is also a Class I water body. Both Bayou George Creek and Bear Creek provide flows to Deer Point Lake, a potable water supply for the region. The Deer Point Lake Reservoir currently supplies an average of 45 million gallons per day (MGD) of water for public and industrial water uses in Bay County (FDEP, 2006).

The vast majority of land area within the study area is comprised of coniferous plantations, which have had a significant effect on the landscape of the region. Natural ecosystems in this region of Florida are most effectively maintained through frequent fires. Frequent fire restricts the size, abundance, and distribution of woody shrubs while contributing to the development of a diverse groundcover layer characteristic of many native habitats in the region. Many of this region's rare and endangered species depend on these fire-maintained habitats. Generally, the silvicultural areas within the study area represent various understory conditions that have been influenced by prescribed burning, mechanical clearing, and other land management practices. Some areas have been burned on a sufficient burn rotation to allow for growth of a native understory, whereas other areas are fire suppressed and display an overburden of shrubs that contribute to relatively low species richness in the understory layer. Silvicultural land, as classified by the Florida Land Use, Cover and Forms Classification System (FLUCFCS), comprises approximately 62 percent of the total land use found across all alternative alignments (FLUCFCS types 441, 441W, 443, 443W) and ranges from 58% coverage in Alternative Alignment 17 to 68% coverage in Alternative Alignment 15 (Table 4.2)

Table 4.2
Direct Involvement with Silviculture Land per Alternative Alignment

	Alignment				
FLUCFCS Type	8 (Acres)	14 (Acres)	15 (Acres)	17 (Acres)	19 (Acres)
441	381.2	455.3	553.6	252.2	320.7
441W	208.6	279.4	336.5	238.2	306.4
443	2.4	3.4	3.1	1.1	2.2
443W	0	0	0	0	0
Silviculture Acres Total	592.2	738.1	893.2	491.5	629.3
	61.70%	61.14%	67.78%	58.90%	59.51%

When a 300-foot buffer (each side) accompanies each alternative alignment in order to facilitate an assessment of indirect and cumulative effects on certain environmental elements under study, the relative percentage of silviculture land is slightly higher than that for the "alignment only" area (Table 4.3). However, networks of logging roads associated with the silvicultural lands also traverse the project area. Existing logging roads have been utilized, when feasible, as the proposed location of alignments to reduce potential impacts.

Table 4.3
Indirect Involvement with Silviculture Land per Alternative Alignment

			Alignment		
FLUCFCS Type	8 (Acres)	14 (Acres)	15 (Acres)	17 (Acres)	19 (Acres)
441	1170.2	1289.1	1451.5	724.5	790.7
441W	630.1	827.6	978.9	664.5	792.6
443	5.0	10.1	10.8	1.9	7.0
443W	2.7	2.7	2.7	0	0
Silviculture Acres Total	1,808	2,129.5	2,443.9	1,390.9	1,590.3
	71.8%	70.6%	74.9%	62.7%	60.9%

Additional features normally associated with forest management practices include ditches used to modify wetland hydrology in order to facilitate the establishment and maintenance of pine plantations. Ditches used in any setting can affect site hydrology and depending upon spacing and depth, can significantly alter wetland functions and species composition. Most ditches within stands and adjacent to forest roads within the study area have been in existence for several decades. Some ditches observed during field surveys were bordered by spoil mounds.

Three of the land-use areas observed within the study area are maintained powerline easements, gas transmission easements, and roadside right-of-ways. These areas have been observed to support threatened and endangered plant species. The frequent maintenance of these areas reduces the shrub and tree canopy. During the various seasonal surveys, it was noted that mowing crews were active along roads in Bay and Gulf Counties, often times mowing the listed species in locations where they were identified for this study. Along Highway 22 in Bay County, maintenance crews plowed fire breaks in 2007 at the edge of the right-of-way and adjacent silviculture lands, resulting in the physical disturbance of several areas observed to contain listed plants.

4.2.2 Soils

Soil map units associated with the GCP Alternative Alignments can be found in Appendix A (Figures 2-13). A total of 68 soil types are present within the Alternative Alignments (Table 4.4). Thirty-five (35) of the soil types are considered hydric, which generally indicates the presence of wetlands or wetland inclusions. The locations of these hydric soils were generally consistent with wetland areas identified via desktop analyses and located during field reconnaissance (See Section 6). Certain upland soil types are also of interest as they can be indicators of appropriate habitat for several upland-dependent listed species such as the gopher tortoise (*Gopherus polyphemus*) and associated commensals. Detailed information on listed species and habitat is presented in subsequent sections of this report. Brief descriptions of hydric and non-hydric soils derived from the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Surveys of Bay, Gulf and Calhoun Counties (2006) are also provided

Table 4.4
USDA/NRCS Soils Mapped within Alternative Alignments

Soil	Hydric	Acres by Alignment				
		8	14	15	17	19
ALAPAHA LOAMY FINE SAND	YES			3.6		
ALAPAHA LOAMY SAND	YES	16.2	24.5	34.2		
ALAPAHA LOAMY SAND, 0 TO 2 PERCENT SLOPES	YES			24.6		
ALLANTON SAND	YES		3.2		35.8	38.9
BAYVI AND DIREGO SOILS, FREQUENTLY FLOODED	YES	7.9	7.9	7.9		
CROATAN, RUTLEGE, AND SURRENCY SOILS, DEPRESSIONAL	YES			6.6		
CROATAN-SURRENCY COMPLEX, FREQUENTLY FLOODED	YES	7.2	7.2	7.4		
DOROVAN-CROATAN COMPLEX, DEPRESSIONAL	YES	0.1	0.1	0.1		
LYNN HAVEN FINE SAND	YES	15.4	15.4	15.4		
OSIER FINE SAND	YES		5.8		30.7	53.8
PAMLICO, BIBB, AND RUTLEGE SOILS, FREQUENTLY FLOODED	YES			5.6		
PAMLICO-DOROVAN COMPLEX	YES	6.9	17.8	6.9	4.0	14.9
PAMLICO-PICKNEY COMPLEX, FREQUENTLY FLOODED	YES	1.3	1.3	8.0		
PANSEY LOAMY SAND	YES		1.8	16.0		
PANSEY SANDY LOAM	YES			9.7		
PANTEGO AND BAYBORO SOILS, DEPRESSIONAL	YES			2.5		
PANTEGO SANDY LOAM	YES	5.3	9.2	11.4	10.1	8.7
PELHAM LOAMY FINE SAND	YES	74.8	74.8	89.6		
PELHAM SAND	YES	37.6	24.4	24.5	73.7	59.3
PICKNEY AND RUTLEGE SOILS, DEPRESSIONAL	YES	4.0	4.0	4.0	0.3	0.3
PICKNEY FINE SAND	YES				54.9	54.9

Soil	Hydric	Acres by Alignment				
		8	14	15	17	19
PICKNEY-PAMLICO COMPLEX, DEPRESSIONAL	YES	6.1	6.1	6.1	7.1	7.1
PLUMMER FINE SAND	YES	162.7	162.7	203.7		
PLUMMER SAND	YES	45.5	71.3	35.6	109.1	131.9
PLUMMER SAND, 0 TO 5 PERCENT SLOPES	YES			10.1		
POTTSBURG FINE SAND	YES	37.8	37.8	37.8	16.9	16.9
POTTSBURG SAND	YES	6.2	6.2	6.2	18.1	18.1
RAINS FINE SANDY LOAM	YES	3.9	3.9	4.5		
RAINS SAND	YES	2.8	2.8	2.8		
RUTLEGE SAND	YES	20.6	44.6	19.3	45.8	56.7
RUTLEGE-PAMLICO COMPLEX	YES	49.6	64.6	50.8	57.4	94.9
SURRENCY MUCKY FINE SAND, DEPRESSIONAL	YES	28.2	28.2	30.7		
Hydric Total		540.1	625.6	685.6	463.9	556.4
WATER	UNRANKED	2.8	2.8	2.8	51.0	51.0
Unranked Total		2.8	2.8	2.8	51.0	51.0
ALBANY LOAMY SAND, 0 TO 5 PERCENT SLOPES	NO			0.2		
ALBANY SAND	NO	32.3	32.3	53.9		
ALBANY SAND, 0 TO 2 PERCENT SLOPES	NO	184.1	238	160.3	184.4	220.2
ALBANY SAND, 2 TO 5 PERCENT SLOPES	NO	1.2	1.2	1.2	4.1	4.1
BLANTON FINE SAND, 0 TO 5 PERCENT SLOPES	NO	20.1	60.9	20.1	8.4	49.2
BLANTON SAND, 0 TO 5 PERCENT SLOPES	NO	2.7	2.7	13.8		
BONIFAY SAND, 0 TO 5 PERCENT SLOPES	NO	23.4	23.5	23.6	3.7	3.8
CHIPLEY SAND, 0 TO 5 PERCENT SLOPES	NO		3.0			3.0
FLORALA LOAMY SAND, 0 TO 2 PERCENT SLOPES	NO			8.3		
FOXWORTH SAND, 0 TO 5 PERCENT SLOPES	NO		4.6			4.6

Soil	Hydric	Acres by Alignment				
		8	14	15	17	19
FRIPP-COROLLA COMPLEX, 2 TO 30 PERCENT SLOPES	NO	0.5	0.5	0.5	0.5	0.5
HURRICANE SAND	NO				6.9	6.9
KUREB-COROLLA COMPLEX, ROLLING	NO	0.9	0.9	0.9	0.9	0.9
LEEFIELD LOAMY FINE SAND	NO	41.2	41.2	67.5		
LEEFIELD LOAMY SAND, 0 TO 5 PERCENT SLOPES	NO			28.2		
LEEFIELD SAND	NO	54.8	83.2	118	48.2	58.5
LEON FINE SAND	NO	15.4	15.4	15.4	3.2	3.2
LEON SAND	NO		0.3		62.6	62.9
MANDARIN FINE SAND	NO	7.7	7.7	7.7		
QUARTZIPSAMMENTS, UNDULATING	NO	2.7	2.7	2.7		
RIDGEWOOD FINE SAND	NO	2.0	2.0	2.0		
ROBERTSDALE FINE SANDY LOAM	NO			6.7		
SAPELO SAND	NO	36.8	36.8	36.8		
SCRANTON FINE SAND	NO	9.0	9.0	9.0		
STILSON LOAMY FINE SAND, 0 TO 5 PERCENT SLOPES	NO			1.6		
STILSON LOAMY SAND, 0 TO 2 PERCENT SLOPES	NO			20.7		
STILSON SAND, 0 TO 5 PERCENT SLOPES	NO	10.4	14.3	30.0	2.8	15.8
STILSON SAND, 0 TO 5 PERCENT SLOPES	NO			0.7		
Non-Hydric Total		445.2	580.2	629.8	325.7	433.6

4.2.2.1 Soil Descriptions

Hydric Soils

Alapaha loamy fine sand is a very deep, poorly drained soil that is found on broad flats and low knolls on the southern Coastal Plain. Slopes range from 0 to 2 percent. Individual areas are elongated, irregular in shape, and range from 5 to 100 acres in size. The soil surface layer is typically a black loamy fine sand about 6 inches thick. The water table is at or within 12 inches of the soil surface for about six months during most years. Available water capacity is moderate and permeability is moderately slow in the subsoil. Natural vegetation includes slash pine (*Pinus elliotii*), water oak (*Quercus nigra*), red maple (*Acer rubrum*), black titi (*Cliftonia monophylla*), scattered saw palmetto (*Serenoa repens*), and wiregrass (*Aristida spp.*). Wetness is a severe limitation to most cultivation crops and urban/recreational development. This soil is suitable for pasture and hay.

Alapaha loamy sand is a nearly level, poorly drained soil that occurs in depressional areas along poorly defined drainageways in the flatwoods. Slopes for this soil are smooth to concave and range from 0 to 2 percent. The surface and subsurface layers are loamy sands about 32 inches thick. The upper layer is very dark gray and about 6 inches thick. The water table for the soil is less than 15 inches from the surface for three to six months during most years. It is subject to periods of brief flooding when the water table is high. Permeability is rapid in the surface and subsurface layers and moderately slow in the subsoil. Internal drainage is slow because it is impeded by the high water table. Natural vegetation includes slash and longleaf pine (*Pinus palustris*), scattered sweetgum (*Liquidambar styraciflua*), Blackgum (*Nyssa biflora*), water oak, red maple, sweet gallberry (*Ilex coriacea*), wax myrtle (*Myrica cerifera*), a few saw palmetto, and pineland threeawn (*Aristida beyrichiana*). This soil is not suitable for cultivated crops and is poorly suitable for pasture because of wetness. High water tables and flooding during rainy seasons severely limits urban and recreational development.

Alapaha loamy sand, 0 to 2 percent slopes is a poorly drained soil found on flats, footslopes, and poorly drained drainageways in the Coastal Plain uplands. Slopes are smooth to concave. Areas of this soil are irregular in shape and range from 3 to 400 acres. Typically, the surface layer is very dark gray loamy sand that is about 6 inches thick. The seasonal high water table is between the soil surface to 7 inches below it from December to March and from June through September. The available water capacity is low in the surface and subsurface layers, moderate in the upper part of the subsoil, and low in the lower part of the subsoil. Natural vegetation consists of slash pine, water oak, blackberry (*Rubus spp.*), dog fennel (*Eupatorium capillifolium*), gallberry (*Ilex glabra*), greenbriar (*Smilax spp.*), saw palmetto, wax myrtle, chalky bluestem (*Andropogon virginicus*), yellow Indiangrass (*Sorghastrum nutans*), low panicum (*Panicum spp.*), pineland threeawn, and assorted sedges. This soil is not suited for cultivated crops, pasture, hay, or urban or recreational development due to excessive wetness.

Allanton sand is a poorly drained soil on nearly level or slightly depressional areas along poorly defined drainageways. Slopes are smooth to concave and range from 0 to 2 percent. The surface layer is typically black and very dark gray sand that is about 18 inches thick. The water table is at or near the soil surface for four to six months during most years, and most

low-lying areas and drainageways are flooded for four to six months annually. Available water capacity is low. Permeability is rapid to moderately rapid above the subsoil and is moderately rapid in the subsoil. Internal drainage is very slow due to the high water table. Natural vegetation consists of titi, sweetbay (*Magnolia virginiana*), blackgum, cypress (*Taxodium* spp.), scattered slash and longleaf pine, gallberry, wax myrtle, and pineland threawn. Wetness is a very severe limitation to cultivated crops. Use of this soil as sites for most urban and recreational uses is severely limited.

Aquents are gently undulating, somewhat poorly drained to very poorly drained, modified soils that are found on low landscapes adjacent to canals, coastal bays, and marshes in shallow excavated areas. Slopes typically range from 0 to 5 percent. These soils are formed in loamy and sandy dredge spoil, reworked natural soils, and fill of variable composition. In some areas, these soils were formed in the subsoil and underlying material where material had been excavated. Areas of this soil are usually elongated and rectangular in shape. Size ranges for 3 to several hundred acres. No single pedon is typical for this soil type. Commonly, the surface layer is about 4 inches thick and is composed pale brown fine sand that contains shell fragments. The water table is typically at the soil surface to 12 inches from the soil surface between the months of June and November. Native vegetation has not been specified for this soil type. In many areas, the vegetation includes plant species from the adjacent landscape. Wetness is a severe limitation for cultivated crops, pasture, hay, woodland, and urban and recreational development.

Bayvi and Dirego soils, frequently flooded are very deep, very poorly drained soils that are found in salt marshes and tidal bays along the coast. Slopes are typically 0 to 1 percent. Individual areas are generally elongated and range from 5 to 600 acres. Bayvi soil makes up for about 45 percent of the map unit. Dirego soil makes up about 40 percent of the map unit. Up to 15 percent of the map unit can include poorly drained Duckston and Leon soils. The Bayvi surface layer is typically 26 inches thick and is composed of very dark brown fine sand. The Dirego surface layer is typically 19 inches deep. The upper part of the layer is composed of a very dark grayish brown muck. The lower part is composed of a very dark brown muck. The water table is found between soil surface and 12 inches below the surface year round. Available water capacity is low. Permeability is rapid to very rapid. Natural vegetation consists of black needlerush (*Juncus roemerianus*) and cordgrass (*Spartina* spp.). Tidal flooding, high salinity, and wetness are severe limitations for cultivated crops, pasture, hay, and woodlands. These soils are not suitable to urban or recreational development. Wetness, flooding, excess salt, and subsidence in the Dirego soil are severe limitations.

Croatan, Rutledge, and Surrency soils are poorly drained, depressional soils found in upland depressions. Slopes are less than 2 percent. Areas of this soil map unit are irregular in shape and range from 3 to 500 acres in size. The Croatan surface layer soil is black muck that is about 19 inches thick. The Rutledge soil surface layer is about 17 inches thick and consists of black mucky sand. The Surrency surface layer is composed of black mucky sand that is about 5 inches thick and dark grayish brown sand that is about 8 inches thick. The seasonal high water table is at or above the soil surface for the Croatan and Rutledge soils. The water table for the Surrency soils ranges from above to 6 inches below the soil surface for most of the year. The available water capacity is very high in the surface layer and moderate or high

in the subsurface layers of the Croatan soil, very high in the surface layer and very low or low in the subsurface layer of the Rutledge soil, and moderate in the Surrency soil. Natural vegetation consists of red maple, blackgum, water tupelo (*Nyssa aquatica*), cypress, buttonbush (*Cephalanthus occidentalis*), dahoon holly (*Ilex cassine*), cinnamon fern (*Osmunda cinnamomea*), lizard's tail (*Saururus cernuus*) and royal fern (*Osmunda regalis*). This map unit is not suitable for cultivated crops, pasture, hay, pine production, or urban or recreational development. Severe limitations include severe wetness, ponding, and subsidence.

Croatan-surrency complex, frequently flooded are very deep, very poorly drained soils that are located in backswamps on floodplains. Slopes range from 0 to 1 percent. This complex is made up of 45 percent Croatan soil and 35 percent Surrency soil. Poorly drained Pelham and Plummer soils make up about 20 percent and are found on slight knolls near the edge of the mapped complex. Areas of the complex are elongated in shape and range in size from 50 to several hundred acres. The surface layer of the Croatan soil is muck with a depth of 42 inches. The Surrency soil has a surface layer that consists of black mucky fine sand and has a thickness of about 18 inches. The seasonal high water table is at or 12 inches below the soil surface for six to nine months in most years. Available water capacity is very high for the Croatan soil and moderate in the Surrency soil. Permeability is very slow in the Croatan soil and moderate in the Surrency. Natural vegetation includes blackgum, cypress, sweetbay, red maple, swamp tupelo, scattered slash pine, ferns, and grasses. The soils are not suitable for cultivated crops, woodland, pasture, hay, or urban or recreational development. Flooding, ponding, wetness, and low bearing strength are severe limitations.

Dorovan-Croatan complex, depressional are very deep, very poorly drained soils that are found in depressions. Slopes range from 0 to 2 percent. This map unit consists of 55 percent Dorovan soil and 40 percent Croatan soil. Poorly drained Pantego and Surrency soils make up about 10 percent and occur on slight rises within the complex. Areas of these soils are intermingled so it is impractical to separate them at the scale used for mapping. Areas are irregularly shaped and range from 10 to 500 acres. The surface layer of the Dorovan soil is very dark brown and has a depth of 2 inches. The surface layer of the Croatan soil has a depth of 42 inches and is dark brown, very dark brown, and very dark grayish brown muck. For the Dorovan soils, the water table is typically between 6 inches below the soil surface to 12 inches above the soil surface during a typical year. In a typical year, the water table is between 12 inches below the soil surface to the soil surface for the Croatan soils. Permeability is moderate in the Dorovan soil and moderately slow in the Croatan soil. Natural vegetation consists of blackgum, cypress, sweetbay, swamp tupelo, black titi, sawgrass (*Cladium jamaicense*) and scattered slash pine. Ponding, wetness, and low bearing strength are severe limitations for cultivated crops, woodland, pasture, hay, or urban or recreational development.

Lynn Haven fine sand is a very deep, poorly drained soil that is in low areas of flatwoods in the southern Coastal Plain. Slopes range from 0 to 2 percent. Individual areas are irregular in shape and range from 5 to 200 acres in size. The surface layer is very dark grayish brown fine sand that is about 14 inches thick. The seasonal high water table is typically at the soil surface to 6 inches below the soil surface from February to September. Available water

capacity is low. Permeability is moderately rapid. Natural vegetation consists of slash pine, bay trees (*Magnolia* spp.), wax myrtle, black titi, gallberry, scattered saw palmetto, and fetterbush (*Lyonia lucida*). Wetness is a severe limitation for cultivated crops, pastures, and urban or recreational development.

Maurepas muck, frequently flooded is a very deep, very poorly drained soil located on flood plains consisting of slightly brackish swamps and marshes. Slopes are generally 0 to 1 percent. Areas of this soil are elongated or irregular in shape and range from 5 to several hundred acres in size. The surface layer of the soil is very dark brown muck and is about 3 inches thick. In a typical year, the seasonal high water table varies from 12 inches above the soil surface to 6 inches below it. The water table also fluctuates slightly due to the tide. The soil is flooded by high tides several times each month. Natural vegetation consists of sawgrass, big cordgrass, and black needlerush. In some areas, vegetation can also include scattered cypress, bay, and gum trees (*Nyssa* spp.). This soil is not suitable to cultivated crops, pasture, hay, woodland, or urban or recreational development. The flooding, ponding, and low bearing strength of the soil are severe limitations.

Osier fine sand is a poorly drained soil that is in nearly level or slightly depressional areas and flatwoods. Slopes for these soils are between 0 and 2 percent. Typically the surface layer is black fine sand about 8 inches thick. The water table is 10 inches from the surface for three to six months during most years. Some low-lying areas are ponded for brief periods in most years. Permeability is moderately rapid in the surface and subsurface layers and is moderate in the subsoil. Available water capacity is low in the surface and subsurface layers and is moderate in the subsoil. Internal drainage is slow, impeded by the high water table. Natural vegetation includes slash and longleaf pine, sweetgum, water oak, and cypress. Wetness and thick sandy layers above the subsoil are severe limitations for cultivated crops. The high water table and ponding during rainy seasons are limitations for recreational or urban development. The sandy texture and high water table are severe limitations to use of this soil as sites for sanitary landfill.

Pamlico, Bibb, and Rutledge soils, frequently flooded are very poorly to poorly drained soils that are found on floodplains along creeks and streams. Slopes are less than 2 percent. Areas of the map unit are elongated in shape and range from 5 to 900 acres in size. Typically, the surface layer of the Pamlico soil is very dark brown mucky peat that is 7 inches thick and a black muck to a depth of 31 inches. The Bibb surface layer is a very dark gray sandy loam that is about 8 inches thick and a dark gray sandy loam to a depth of 12 inches. The Rutledge surface layer is black sand about 13 inches thick. For most of the year, the seasonal high water table is at or above the surface layer for the Pamlico soil and at or 6 inches below the surface layer for the Bibb and Rutledge soils. Flooding is likely to occur often under unusual weather conditions. Excess water tends to pond in low-lying areas for long periods after heavy rains. Available water capacity is very high in the surface layer and medium to high in the substratum for the Pamlico soil, moderate or high in the Bibb soil, and low in the Rutledge soil. Natural vegetation consists of red maple, blackgum, water tupelo, cypress, buttonbush, dahoon holly, cinnamon fern, lizard's tail, royal fern, and wild pine (*Pinus* spp.). This map unit is not suitable for cultivated crops, pasture, hay, woodlands, or urban or recreational development. Flooding, excessive wetness and subsidence are severe limitations.

The Pamlico-Dorovan complex consists of very poorly drained soils that occur in intricately mixed patterns, mainly as depressional areas along low gradient drainageways. The Pamlico soils make up about 40 percent of the complex and the Dorovan soils make up about 35 percent. Rutledge, Alapaha, Pansey, Pantego, Plummer, Potsburg, and Rains soils make up about 25 percent of the complex and generally occur on the edges of the complex. Areas of this complex are mostly rounded or oblong and are from 10 to 200 acres. The surface layer is black muck that is 32 to 60 inches thick. These soils are ponded after flooding for four to twelve months in most years. When not ponded, the water table is usually within 10 inches of the surface. The water table may recede to a depth of 40 inches or more in the late fall or times of extended drought. This complex is moderate in permeability and has a very high available water capacity. The natural vegetation associated with these soils consisting mostly of water-tolerant hardwoods such as water oak, sweetbay, blackgum, red maple, black willow, alder (*Alnus serrulata*), and cypress. Due to the high water table, these soils are not suitable for cultivating crops or pastures. Overcoming the excessive wetness of these soils is difficult. Flooding, thick layers of organic material, and high water table are severe limitations to use of these soils as sites for urban, sanitary, and recreational uses.

Pamlico-Pickney complex, frequently flooded are soils that are very deep and very poorly drained and occur on floodplains. Slopes are 0 to 1 percent. Areas of this soil unit are elongated in shape and range from 10 to several hundred acres in size. The soil complex consists of about 55 percent Pamlico soils and 40 percent Pickney soils. Poorly drained Lynn Haven, Plummer, and Scranton soils make up the remaining 5 percent and are found on knolls and transitions in the flatwoods. The Pamlico soil surface layer is muck about 22 inches deep while the Pickney surface layer is back, very dark brown, and very dark grayish fine sand that is about 51 inches deep. The seasonal high water table is at or 12 inches above the soil surface throughout the year for the Pamlico soil and it ranges from 12 inches above to 18 inches below the soil surface from November through July for the Pickney soil during most years. Available water capacity is very high for the Pamlico soil and low in the Pickney soil. Permeability is moderate in the Pamlico soil and rapid in the Pickney soil. Natural vegetation includes blackgum, cypress, sweetbay, red maple, scattered slash pine, ferns, and grasses. This complex is not suitable for cultivated crops, woodland, pasture, hay, or urban or recreational development. The flooding, ponding, wetness, and low bearing strength are severe limitations.

Pansey loamy sand is a poorly drained, nearly level soil that occurs on broad flats and in poorly drained, low-gradient drainageways. Slopes are smooth to concave. The surface layer is typically a very dark gray loamy sand that is about 7 inches thick. The water table is usually within 20 inches of the surface during the winter, the wet season during most years and is subject to ponding for short periods of time after flooding. Permeability is moderately rapid in the surface and subsurface layers and slow in most of the subsoil. Available water capacity is moderate in the surface and subsurface and is high in the subsoil. Internal drainage is slow due to a high water table. Natural vegetation consists of slash, loblolly and longleaf pine, sweetgum, blackgum, water oak, red maple, cypress in depressional areas, gallberry, wax myrtle, saw palmetto, and pineland threeawn. Wetness and naturally low fertility are severe limitations for cultivated crops. High water tables and flooding during the rainy season are severe limitations to recreational and urban development.

Pansey sandy loam is a poorly drained soil that is located on flats and in depressions in interstream divides in the uplands. Slopes range from 0 to 2 percent. Areas of this soil are irregular in shape and range from 3 to 225 acres. The soil surface layer is very dark gray sandy loam and is typically 8 inches thick. The seasonal high water table is at or near the surface from December through March and from June through September during a normal year. Available water capacity is moderate in the surface layer and the upper part of the subsoil and very high in the lower part of the subsoil. Natural vegetation consists of slash pine, water oak, blackberry, gallberry, dog fennel, greenbriar, saw palmetto, wax myrtle, chalky bluestem, yellow Indiangrass, low panicum, pineland threeawn, and assorted sedges. This soil is not suited for cultivated crops, pasture, or hay due to excessive wetness. Wetness and slow percolation are severe limitations for urban and recreational development for this soil.

Pantego and Bayboro soils, depressional are very deep, very poorly drained soils in depressions and along poorly defined streams. Slopes range from 0 to 2 percent. Areas of the soil are elliptical or irregular in shape and range from 3 to 200 acres in size. This map unit consists of about 50 percent Pantego soil and 30 percent Bayboro soil. Poorly drained Bladen and Rains soils make up the remaining 20 percent and occur near the edges of the soil map unit. The Pantego soil has an upper soil layer that is very dark gray and very dark grayish brown loamy sand that is about 18 inches thick. The Bayboro soil has an upper soil layer that is a fine sandy loam that is about 10 inches thick. The seasonal high water table is above the soil surface for about six to nine months during a typical year. Available water capacity for the soils is moderate. Permeability is moderately slow in the Pantego soil and slow in the Bayboro soil. Natural vegetation includes blackgum, cypress, sweetbay, swamp tupelo, black titi, swamp cyrilla (*Cyrilla racemiflora*), sawgrass, scattered slash pine, titi, St. Johns Wort (*Hypericum* spp.), and pitcher plants (*Sarracenia* spp.). These soils are not suited for cultivated crops, woodland, pasture, hay, or urban or recreational development. Ponding and wetness are severe limitations.

Pantego sandy loam is a very poorly drained, nearly level soil that occurs in wet depressions and along poorly defined drainageways in the flatwoods and it occurs along moderately well defined drainageways in the uplands. Slopes are smooth to concave and range from 0 to 2 percent. The surface layer is a dark gray to black sandy loam that is typically 18 inches thick. The water table is typically less than 15 inches from the soil surface and depressional areas are ponded for one to three months annually. Available water capacity is high throughout the soil. Permeability is moderately rapid in the surface layer and moderate in the subsoil. Internal drainage is slow due to the high water table. Natural vegetation consists of pond pine, tupelo gum, sweetbay, cypress, titi, gallberry, reeds, wax myrtle, and pineland threeawn. Wetness is a severe limitation for cultivated crops. Flooding and the very high water table during the rainy seasons are severe limitations to use of this soil as sites for recreational or urban development.

Pelham loamy fine sand is a very deep, poorly drained soil that is found in low areas of flatwoods and on low flats of the southern Coastal Plain. Slopes range from 0 to 2 percent. Areas of this soil are elongated or irregular in shape and range from 5 to 100 acres. The surface layer of the soil is a black loamy fine sand that is about 7 inches thick. The seasonal

high water table ranges from soil surface to 12 inches below the surface from January through April. Available water capacity is low. Permeability is moderately slow. Natural vegetation includes slash pine, water oak, red maple, black titi, gallberry, scattered palmetto, and wiregrass. Most areas of this soil are used for the commercial production of pine. This soil is poorly suited for most cultivated crops and urban development. Wetness is a management concern.

Pelham sand is a deep, poorly drained, nearly level soil that is on broad flats and slightly depressional areas along poorly defined drainageways. Slopes are smooth and concave and range from 0 to 2 percent. Typically the surface layer is dark gray sand about 6 inches thick. This soil has a water table within 15 inches of the surface for three to six months during most years and is subject to brief periods of flooding. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. The natural vegetation consists of longleaf and slash pine, sweetgum, blackgum, sweetbay, water oak, cypress, gallberry, wax myrtle, and pineland threeawn. Wetness is a severe limitation for cultivated crops. Flooding and the very high water table during the rainy seasons are severe limitations to use of this soil as sites for recreational or urban development.

Pickney and Rutledge soils, depressional are very deep, very poorly drained soils that are located in broad, shallow depressions. Areas of these soils are elongated or irregular in shape and range from 25 to 500 acres in size. This map unit consists of 40 percent Pickney soil and 35 percent Rutledge soil. Poorly drained Lynn Haven, Pottsburg, and Scranton soils make up about 25 percent and can be found on slight knolls within the mapped area. The surface layer of the Pickney soil is typically a black, very dark brown, and very dark grayish brown fine sand that is about 51 inches thick. Typically, the surface layer of the Rutledge soil is black fine sand that is about 19 inches thick. The seasonal high water table is above the soil surface from November through May in a normal year. Available water capacity is low and permeability is rapid throughout the soils. Natural vegetation includes blackgum, cypress, sweetbay, swamp cyrilla, black titi, and scattered slash pine. These soils are not suited for crop cultivation, pasture, hay, or urban or recreational development. Ponding, wetness, and low bearing strength are severe limitations.

Pickney fine sand is a very poorly drained soil that is on nearly level, broad flats and slightly depressional areas along poorly defined drainageways. Slopes are smooth the concave and range from 0 to 1 percent. The soil surface layer is black fine sand that is about 30 inches thick. The water table is very near or at the soil surface for four to six months most years for this soil. Most of these soils in low-lying areas are ponded for three to six months after flooding during the rainy season. Available water capacity is medium in the surface layer and low below. Permeability is rapid. Internal drainage is very slow due to the high water table. Natural vegetation for the soil consists of sweetbay, blackgum, cypress, titi, scattered slash and longleaf pine, gallberry, wax myrtle, pineland threeawn, St. Johns Wort, and maidencane (*Panicum hemitomon*). Wetness is a severe limitation for crop cultivation. Extremely high water tables and flooding severely limit recreational and urban development. The sandy texture, flooding, and high water table prohibit the use of these sites for sanitary landfills.

Pickney-Pamlico complex – depressional is a very deep, very poorly drained soil that is located in depressions. Slopes range from 0 to 2 percent. Areas of this soil are irregular in shape and range from 10 to 500 acres. Pickney soil makes up about 50 percent of the complex and Pamlico makes up about 35 percent. Poorly drained Lynn Haven and Scranton soils make up about 15 percent of the complex and are found on slight rises within the mapped area. The surface soil layer of the Pickney soil is black, very dark brown, and very dark grayish brown fine sand that is about 51 inches thick. The Pamlico surface layer consists of a brown to black muck that is about 22 inches thick. Water table levels are above the soil surface for six to nine months during a typical year. Available water capacity is very high for the Pamlico soil and low in the Pickney soil. Permeability is moderate in the Pamlico and rapid in the Pickney soil. Natural vegetation includes blackgum, cypress, sweetbay, swamp cyrilla, black titi, and scattered slash pine. Ponding, wetness, and low bearing strength are severe limitations for cultivated crops, woodland, pasture, hay, or urban or recreational development.

Plummer fine sand is a very deep and poorly drained soil that is found in low areas of flatwoods and in broad, slight depressional areas on flats. Slopes range from 0 to 2 percent. Areas of this soil are irregular in shape and range from 15 to 500 acres in size. The surface layer of the soil is typically very dark gray fine sand and has a thickness of 10 inches. The seasonal high water table is at the surface to 12 inches below the surface from December through July during a normal year. Available water capacity is low and permeability is moderately slow. Natural vegetation includes slash pine, scattered bald cypress (*Taxodium distichum*), sweetbay, scattered saw palmetto, gallberry, wax myrtle, pitcher plants, black titi, and fetterbush. This soil is poorly suited for cultivated crops, and urban development. Wetness is a management concern.

Plummer sand is a poorly drained, nearly level soil that is in low-lying areas and in poorly defined drainageways. Slopes are concave to smooth and range from 0 to 2 percent. The surface and subsurface layers are sand about 48 inches thick; the top layer being dark gray and about 7 inches thick. The water table for this soil is less than 10 inches from the surface for three to six months during most years. Low-lying areas are sometimes ponded for brief periods during most years. Permeability is moderately rapid in the surface and subsurface layers and moderate in the subsoil. Available water capacity is low in the surface and subsurface layers and medium in the subsoil. Internal drainage is slow, impeded by the high water table. The natural vegetation consists mostly of slash and longleaf pine, sweetgum, water oak, cypress, gallberry, pineland threeawn, pitcher plants, and wax myrtle. Wetness and the thick sandy layers above the subsoil are severe limitation for cultivated crops. The high water table and ponding during the rainy seasons are severe limitations for recreational or urban development. The sandy texture and high water table severely limits the use of the soil as sites for sanitary landfill development.

Plummer sand, 0 to 5 percent is a poorly drained soil that is found in flatwoods and in poorly defined drainageways in the Coastal Plain uplands. Areas of this soil are elongated or irregular in shape and range from 3 to 1,000 acres in size. The soil surface layer is typically very dark gray sand that is about 8 inches thick. The seasonal high water table is at or near the surface From December through March and from June through September. The available

water capacity is very low or low in the surface and subsurface layers and low to moderate in the subsoil. Natural vegetation consists of slash pine, water oak, blackberry, gallberry, dogfennel, greenbriar, saw palmetto, wax myrtle, chalky bluestem, yellow Indiangrass, low panicum, pineland threeawn, and assorted sedges. This soil is not suited for cultivated crops, pasture, or hay because of excessive wetness. Wetness is a severe limitation for urban and recreational development.

Pottsburg fine sand is a very deep, poorly drained soil that is found in low areas of flatwoods on the southern Coastal Plain. Slopes range from 0 to 2 percent. Areas of this soil are irregular in shape and range from 5 to 200 acres. Typically, the soil surface layer is very dark gray fine sand that is about 6 inches thick. The season high water table ranges between the soil surface to 6 inches below the soil surface from February to September. Available water capacity is low and permeability is moderate. Natural vegetation consists of slash pine, bay trees, saw palmetto, wax myrtle, gallberry, wiregrass, black titi, and fetterbush. This soil is poorly suited for most cultivated crops. Wetness is a management concern. This soil is suited for pasture and hay. This soil is poorly suited for urban or recreational development. Wetness and seasonal droughtiness are management concerns.

Pottsburg sand is a poorly drained soil that is on nearly level, low-lying areas of the flatwoods. Slopes are 0 to 2 percent. Typically, the surface layer is dark gray sand about 5 inches thick. This soil has a water table within 10 inches of the surface for four to six months during most years. Some included low-lying areas are ponded for two to six months annually. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. Internal drainage is very slow, impeded by the high water table. Available water capacity is low in the surface layer and is moderate in the subsoil. Natural vegetation for this soil consists of sweetbay, titi, blackgum, water oak, scattered slash and longleaf pine, gallberry, saw palmetto, wax myrtle, and pine land threeawn. Wetness is a severe limitation for cultivated crops. The high water table is a severe limitation to use of this soil as a site for recreational or urban development. The sandy texture and high water table are severe limitations to use of this soil as sites for sanitary landfills.

Rains fine sandy loam is a very deep and poorly drained soil that is found on low flats. Slopes range from 0 to 2 percent. Areas of the soil are elongated or irregular in shape and range from 5 to 400 acres in size. The surface layer is typically a very dark grayish brown fine sandy loam about 9 inches thick. The water table is at the soil surface to 12 inches below the surface from November through April. Available water capacity and permeability is moderate. Natural vegetation includes slash pine, sweetbay, water oak, red maple, wiregrass, pitcher plants, and scattered black titi, St. Johns Wort, and saw palmetto. This soil is unsuitable for cultivated crops and urban and recreational development because wetness is a management concern.

Rains sand is a poorly drained, nearly level soil that occurs in low-lying areas on the coastal plain and in depressional areas. Slopes are smooth and range from 0 to 2 percent. Typically, the surface layer is very dark gray sand that about 6 inches thick. The water table is typically 10 inches from the surface for two to six months annually. Available water capacity is low in the surface and subsurface and medium in the subsoil. Permeability is rapid in the surface

and subsurface and moderate in the subsoil. The natural vegetation consists of slash pine, blackgum, scattered cypress, pineland threeawn, gallberry, and wax myrtle. Cultivated crops are severely limited due to soil wetness. Recreational development, urban development and sanitary landfill development is severely limited by the high water table.

Rutledge sand is a very poorly drained soil found on nearly level or depressional areas along drainageways. Typically, the slopes for this soil are smooth and concave and range from 0 to 2 percent. The surface layer of the soil is sand that is usually about 22 inches thick. The upper 13 inches is black, and the lower 9 inches is very dark gray. The water table is at or near the surface for four to six months during most years and is ponded for four to six months annually. Available water capacity is low. Permeability is rapid and the internal drainage of this soil is very slow, impeded by the high water table. The natural vegetation for this soil is titi, sweetbay, blackgum, cypress, and scattered slash pine. Soil wetness is a severe limitation for cultivated crops. The high water table and ponding of depressional areas during rainy seasons are severe limitations for using a site with this soil for recreational and urban development projects. The high water table and sandy texture limit the use of this soil for sanitary landfills.

Rutledge-Pamlico complex consists of nearly level, very poorly drained, and frequently flooded soils. Areas of these soils occur in irregular patterns and are hard to map separately due to the scale used. This complex is found mainly in drainageways with a few widespread depressional areas included. The Rutledge soils make up about 35 of the complex and the Pamlico soils make up about 25 of the complex. Pantego, Albany, Allanton, Osier, Pelham, Plummer, and Pottsburg soils make up the remaining portion of the complex although they are not always present in each complex. These soil formations are usually long and moderately narrow and are about 30 to 500 acres in size. The depressional areas are about 10 to 300 acres in size. The Rutledge soils typically have a black and very dark grayish brown loamy sand surface layer about 20 inches thick. The Rutledge soils have a water table near the soil surface for four to six months during a typical year and may be ponded after flooding. Permeability is rapid throughout. Available water capacity is low. Internal drainage is slow due to high water table. The Pamlico soils typically have a black muck surface layer that is 30 inches thick. These soils may be ponded for four to six months in most years after flooding. Even when not flooded, water tables are typically found within 20 inches of the soil surface. During the dry seasons, the water table may fall briefly to 40 inches below the soil surface. Pamlico soils are moderate in permeability and have high available water capacity. Natural vegetation consists of sweetbay, blackgum, red maple, sweetgum, slash pine, titi, wax myrtle, sweet azalea (*Rhododendron viscosum*), gallberry, and greennbriar. Wetness and flooding are severe limitations for cultivated crops. The use of these soils as sites for recreational and urban development is severely limited due to the high water table and the hazard of frequent flooding in rainy seasons. The soils are also unsuitable for use as sanitary landfill sites.

Surrency mucky fine sand, depressional is a very deep, very poorly drained soil that is found in shallow depressions and along poorly defined streams and drainageways. Slopes range from 0 to 2 percent. Areas of this soil are elliptical or irregular in shape and range from 5 to 200 acres in size. The surface layer is typically black mucky fine sand that is about 18

inches thick. The water table is typically 12 inches above to 6 inches below the soil surface year around. Available water capacity and permeability of the soil is moderate. Natural vegetation consists of blackgum, cypress, sweetbay, swamp tupelo, black titi, swamp cyrilla, sawgrass, scattered slash pine, St. Johns Wort, and pitcher plants. This soil is not suited to cultivated crops, woodland, pasture, hay, or urban or recreational development. Ponding and wetness are severe limitations.

Non-Hydric Soils

Albany sand (0 to 2 percent slopes) is a nearly level, somewhat poorly drained sandy soil that occurs along defined drainageways and on areas leading to the lower wet areas. Slopes are smooth and the soil surface layer is grayish brown sand, approximately 8 inches thick. The water table is 18 to 30 inches below the surface for 1 to 3 months during most years. Available water capacity is very low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface layer, moderately rapid in the subsurface layer, and moderate in the subsoil. Organic matter content is generally medium. Wetness is a severe limitation for cultivated crops. Wetness is a moderate limitation for local road and street development and a severe limitation for septic tank and trench landfill development, therefore water control is necessary for these uses. Natural vegetation includes longleaf pine, slash pine, blackjack oak (*Quercus marilandica*), post oak (*Quercus stellata*), gallberry, wax myrtle, and pine land threeawn.

Blanton sand (0 to 5 percent slopes) is a moderately well drained soil found on uplands on the southern Coastal plain, with individual areas being irregular in shape and size. Typically, the soil surface layer is dark grayish brown sand approximately 7 inches thick. The water table is anywhere from 48 to 72 inches deep at seasonal highs and may be perched above subsoil following heavy rains. Available water capacity is very low throughout while permeability is moderate or moderately slow in the subsoil. The soil is poorly suited to cultivated crops but suited to pasture and hay. Wetness is a management concern affecting septic tank absorption fields. Droughtiness, rapid leaching of plant nutrients, and wind erosion are management concerns. Natural vegetation includes longleaf pine, slash pine, turkey oak (*Quercus laevis*), live oak (*Quercus virginiana*), ferns, huckleberry (*Gaylussacia dumosa*), and scattered saw palmetto.

Bonifay sand (0 to 5 percent slopes) is a well drained, nearly level to gently sloping soil that occurs on narrow to moderately broad ridges on the uplands. Slopes are smooth to convex. Typically, the surface layer is brown sand about 7 inches thick. The water table is more than 72 inches deep, although after heavy rainfall a perched water table may remain above the subsoil for 1 to 5 days. Available water capacity is low and permeability is rapid in the surface and moderate in the subsoil. Organic matter content is low throughout this soil. Wetness is a moderate limitation for using this soil as a site for dwellings with basements. The soil is moderately suited to pastures and pine production, while it is severely limited to use for cultivated crops. Natural vegetation includes longleaf pine, slash pine, blackjack oak, turkey oak, live oak, post oak, persimmon (*Diospyros* spp.), huckleberry, and pineland threeawn.

Chipley sand (0 to 5 percent slopes) is a somewhat poorly drained, nearly level (smooth) to gently sloping (convex) soil that is between the higher upland soils and lower lying, wet flatwoods. Typically, the soil surface layer is dark gray sand that is approximately 4 inches thick. The water table has a depth of 30 to 40 inches for 1 to 3 months and a depth of 40 to 60 inches for 3 to 6 months in most years. Available water capacity is low and permeability is rapid. Water is a severe limitation for cultivated crops. The soil is moderately well suited to pasture and hay crops. The high water table is a severe limitation for urban and recreational development. Natural vegetation includes slash and longleaf pine, post oak, bluejack oak (*Quercus incana*), turkey oak, huckleberry, dogwood (*Cornus* spp.), saw palmetto, bluestem (*Schizachyrium* spp.), and pine land threeawn.

Floral sand (0 to 2 percent slopes) is a somewhat poorly drained soil found on toeslopes in the uplands. Slopes are smooth to concave, and, typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The water table depth reaches a seasonal high of 18 to 30 inches for 8 months out of the year. The available water capacity is low in the surface layer and moderate in the subsoil. Wetness in the soil type limits the variety of crops available, the production of slash pine, and the types of infrastructure it would support. This soil type is well suited to pasture and hay and not suited to infrastructure/construction. Natural vegetation includes loblolly pine (*Pinus taeda*), white oak (*Quercus alba*), pignut hickory (*Carya glabra*), American beech (*Fagus grandifolia*), flowering dogwood (*Cornus florida*), and numerous native herbaceous groundcover.

Foxworth sand (0 to 5 percent slopes) is a moderately well drained, nearly level (smooth) to gently sloping (convex) soil that occurs between the high upland soils and lower lying, wet flatwoods. The soil surface layer is usually grayish brown sand about 4 inches thick. The water table depth is typically 40 to 72 inches below the soil surface for 1 to 3 months out of the year. The water table can rise to 30 to 40 inches below the surface for less than 30 days in some years. Available water capacity is low and permeability is very rapid. Droughtiness and rapid nutrient leaching are severe limitations for most cultivated crops. The sandy texture is severe limitations for recreational uses. Occasional high water tables are moderate limitations for urban development as cutbanks are subject to caving. Natural vegetation consists of slash and longleaf pine, live oak, post oak, bluejack oak, southern red oak (*Quercus falcata*), huckleberry, dogwood, native shrubs, saw palmetto, and pineland threeawn.

Foxworth sand (5 to 8 percent slopes) is a moderately well drained sloping soil that occurs on upland hillsides leading to lower lying, wet flatwoods and drainageways. The slopes are smooth to convex and the soil surface is dark gray sand about 3 inches thick. The water table is typically 40 to 72 inches from the soil surface for 1 to 3 months a year. For less than 30 cumulative days during the year, the water table can rise to 30 to 40 inches from the soil surface. Available water capacity is very low and permeability is very rapid. Droughtiness, rapid leaching of plant nutrients, and erosion hazards are severe limitations for row crops. Droughtiness is a moderate limitation for pasture and hay. Cutbanks and trenches are subject to caving in this soil. Seepage and high water table are moderate to severe limitations for urban and recreational uses. Sandy texture has severe limitations for recreational uses. Natural vegetation associated with this soil consists of slash and longleaf pine, live oak, post

oak, red oak (*Quercus rubra*), bluejack oak, huckleberry, sparse dogwood, pineland threeawn, and other assorted native understory species.

Fripp-Corolla Complex sand (2 to 30 percent slopes) is composed of excessively drained Fripp soils and moderately well drained to somewhat poorly drained Corolla soils found on undulating, dunelike coastal areas. The soil surface layer is gray sand about 3 inches thick for the Fripp soil and dark gray sand about 3 inches thick for the Corolla soil. Depth to the water table is consistently more than 72 inches for the Fripp soil and 20 to 60 inches below the soil surface for 1 to 3 months for the Corolla soil. Available water capacity for both soils is very low while permeability for both is rapid. Organic matter content for both is very low. This complex is suited for the production of pines, but the soils are not well suited for cultivated crops or pasture. Natural vegetation on this complex includes sand pine (*Pinus clausa*), sea-oats (*Uniola paniculata*), switchgrass (*Panicum virgatum*), rosemary (*Rosmarinus officinalis*), reindeer lichen (*Cladonia rangiferina*), scrub live oak, and palmetto.

Hurricane sand is a somewhat poorly drained, nearly level soil that occurs between the uplands and the lower lying wet flatwoods. Slopes are smooth to slightly convex and range from 0 to 2 percent. The available water capacity for the soil is low and permeability is rapid. Water is severe limitations for cultivated crops, urban development, and recreational development. Natural vegetation on this soil consists of slash and longleaf pine, bluejack oak (*Quercus incana*), turkey oak, post oak, saw palmetto, broomsedge (*Andropogon* spp.), bluestem, pineland threeawn, and an understory other native plant species.

Krueb-Corolla Complex sand (rolling) is a very deep, poorly to excessively drained soil present on remnant coastal dunes and in swales. The surface layer of the Krueb soil is grey fine sand about 2 inches deep and the surface layer of the Corolla soil is very pale brown fine sand about 4 inches deep; slopes are generally 5 to 15 percent. The water table is below a depth of 72 inches throughout the year for the Kureb soil while it is present at a depth of 18 to 36 inches seasonally in the Corolla soil. The available water capacity is very low and permeability is rapid in the Krueb soil and very rapid in the Corolla soil. This soil is poorly suited for urban development, crop cultivation, or pastures, and the slope, loose surface layer consistency, and droughtiness severely limit use. Natural vegetation on this soil includes sand pine, scattered slash pine, sand live oak (*Quercus geminata*), Chapman oak (*Quercus chapmanii*), myrtle oak (*Quercus myrtifolia*), wax-myrtle, saw palmetto, and sea-oats.

Lakeland sand (0 to 5 percent slopes) is an excessively drained, nearly level (smooth) to gently sloping (generally convex) soil and occurs on broad upland areas. The surface layer is dark brown sand about 4 inches thick and depth to the water table is more than 80 inches throughout the year. The available water capacity is low and permeability is very rapid throughout the layers. The sandy texture severely limits use of this soil for cultivated crops and is too sandy to be trenched. Soil limitations also severely limit recreational development. Natural vegetation found on this soil includes longleaf and slash pine, blackjack oak, bluejack oak, turkey oak, post oak, catbriar (*Smilax* spp.), blackberry, yaupon holly (*Ilex vomitoria*), dwarf live oak (*Quercus minima*), runner oak (*Quercus pumila*), huckleberry, milkweed (*Asclepias* spp.), ragweed (*Ambrosia* spp.), dog fennel, and sparse pineland threeawn.

Leefield loamy fine sand is a very deep, somewhat poorly drained soil found on low uplands and narrow ridges in areas of flatwoods. The surface layer is very dark grey loamy fine sand about 9 inches thick and the slope ranges from 0 to 2 percent. Depth to the water table from the surface is from 18 to 30 inches for most of the year. The available water capacity is low, and permeability is moderately slow throughout. Wetness and seasonal droughtiness are management concerns for this type of soil. This soil is suited to most cultivated crops, pasture, and hay, as well as to local roads and streets. This soil is not suited to urban or small commercial development due to wetness. Natural vegetation found on this soil consists of slash pine, longleaf pine, live oak, laurel oak (*Quercus laurifolia*), dogwood, sweetgum, saw palmetto, and greenbrier.

Leon sand is a poorly drained, nearly level soil that is found in the flatwoods. Slopes are generally smooth to slightly convex and range from 0 to 2 percent. The surface layer is typically very dark gray sand approximately 3 inches thick. Depth to the water table from the soil surface is around 10 inches for 1 to 4 months and 10 to 40 inches for about 9 months in most years. The available water capacity is very low in the surface and subsurface and low in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate to moderately rapid in the subsoil. Water table height severely limits recreational and urban development. Natural vegetation found on this soil consists of longleaf pine, slash pine, pond pine (*Pinus serotina*), wax myrtle, saw palmetto, runner oak, gallberry, and pineland threeawn. Wetness is a severe limitation for cultivated crops.

Mandarin fine sand is a very deep, somewhat poorly drained soil present on low ridges and knolls in areas of flatwoods. Slopes range from 0 to 2 percent, and the surface layer is very dark gray fine sand approximately 7 inches thick. Depth to the water table ranges from 18 to 42 inches for half of the year. Available water capacity is low, while permeability is moderate. Organic matter content in the surface layer tends to be very low. Wetness and seasonal droughtiness are management concerns for this soil type. This soil type is suited to slash and longleaf pine planting and urban development. This soil is not well suited to pasture and hay or most cultivated crops. Natural vegetation found on this soil includes slash pine, longleaf pine, turkey oak, pennyroyal (*Mentha pulegium*), and saw palmetto.

Quartzipsamments is a very deep, somewhat poorly drained to excessively drained soil present on high deposits of sandy dredge soil. Slopes range from 0 to 5 percent, and the surface layer is light gray coarse sand about 4 inches thick. A seasonal high water table is present at a depth of more than 72 inches. All other soil properties are so variable that they cannot be predicted without personal investigation. Vegetation present is almost nonexistent, with some areas sparsely populated. Some areas are so acidic that no life can be sustained.

Ridgewood fine sand is a very deep, somewhat poorly drained soil present on slightly convex knolls on the Southern Coastal Plain. Slopes range from 0 to 2 percent, and the surface layer is dark grayish brown fine sand about 5 inches thick. The seasonal high water table reaches a depth of 24 to 42 inches for 3-4 months but can reach a depth of 15-24 inches for brief periods. Available water capacity is low or very low, and permeability is rapid throughout. Wetness, seasonal droughtiness, leaching of plant nutrients, and rapid

permeability are management concerns for this soil type. This soil type is suitable for commercial pine production, pasture/hay, and urban development; this soil type is poorly suited to cultivated crops. Natural vegetation found on this soil includes slash pine, longleaf pine, scattered oaks, and saw palmetto.

Robertsdale fine sandy loam is a poorly drained soil found in flat areas that are slightly depressed in relation to the surrounding terrain. Slopes range from 0 to 2 percent, and the surface layer is very dark gray fine sandy loam about 7 inches in depth with iron concretions. The seasonal high water table is located at a depth of 12 to 18 inches for most of the year. Available water capacity is moderate and permeability is low. Wetness is a management concern for production of slash pine and the construction of small commercial structures. This soil is moderately well suited to pasture and hay and production of slash pine; this soil type is poorly suited to cultivated crops and commercial construction. Natural vegetation includes slash pine, live oaks, blackberry, dog fennel, gallberry, greenbrier, saw palmetto, and wax-myrtle.

Sapelo sand is a very deep, poorly drained soil found in flatwoods areas. Slopes range from 0 to 2 percent. The surface layer is very dark grey sand about 6 inches thick. The seasonal high water table is at a depth of 6 to 18 inches for half of the year. Available water capacity is low and permeability is rapid throughout. Wetness is a management concern for urban development. This soil type is suited to pasture and hay as well as the productivity of slash and loblolly pine. This soil is poorly suited for most cultivated crops and urban development. Natural vegetation includes slash pine, longleaf pine, saw palmetto, wax-myrtle, gallberry, runner oak, black titi, and fetterbush.

Scranton fine sand is a very deep, poorly drained soil found in flatwoods areas. Slopes range from 0 to 2 percent. The surface layer is very dark brown fine sand about 9 inches thick. The seasonal high water table is found anywhere from the surface to a depth of 6 to 18 inches for half of the year. Available water capacity is low and permeability is rapid throughout. Wetness is a management concern for cultivating crops and urban development. This soil is suited to pasture and hay as well as the productivity of slash and loblolly pine. This soil is poorly suited for most cultivated crops and urban development. Natural vegetation includes slash pine, longleaf pine, saw palmetto, wax-myrtle, gallberry, runner oak, swamp cyrilla, and fetterbush.

Stilson sand is a very deep, moderately well drained soil found on uplands. Slopes range from 0 to 5 percent. The surface layer is dark grayish brown loamy fine sand about 6 inches thick. The seasonal high water table is found at a depth of 30 to 36 inches for half of the year; the water table may be perched for short periods after any heavy rain event. Available water capacity is low and permeability is moderate. Organic matter content in the surface layer is usually very low. This soil is suited to cultivated crops, pasture and hay, pine production, homesite development, and small commercial buildings. Natural vegetation includes live oak, longleaf pine, ferns, huckleberry, and saw palmetto.

4.2.3 Plant Communities

Habitats within proposed alignments were identified and mapped using the FLUCFCS, third edition 1999. A combination of existing FLUCFCS data from the Northwest Florida Water Management District (NFWFMD), National Wetlands Inventory (NWI) data, USDA soils data, and recent and historical photographs were used to assess and map habitats within the proposed alignments. FLUCFCS data were modified and refined based on aerial photograph signatures and field observations. Future analysis of a preferred alignment will likely include more detailed field-verified modifications of FLUCFCS data presented in this report. See GCP WER for additional details on methods.

Wetlands associated with the study area were largely grouped into two primary community types: hydric pine plantation (FLUCFCS Code 441W) and mixed forested wetland (630). As previously noted, silviculture lands are the dominant land use in the study area and comprise approximately 62 percent of the total land across all alternative alignments. Accordingly, the most abundant wetland community type encountered was hydric pine plantations comprising approximately 60% of the wetlands encountered, which were characterized by slash pine overstories and midstories of myrtle-leaved holly (*Ilex myrtifolia*), wax myrtle, swamp titi, black titi and gallberry. The mixed forested wetland community comprised approximately 23% of the wetlands encountered and had a mixed overstory comprised of varying amounts of red maple, cypress, sweetgum, slash pine, sweetbay, and blackgum, and midstories typically consisted of sweet gallberry, titi, gallberry, and wax myrtle. During the desktop analysis, many of the smaller streams were included within the mixed forested wetland (630) community type due to their size and riparian area composition and structure. FLUCFCS type 510 (Streams and Waterways) was generally used for named stream crossings or where open water was visible on the 2007 high resolution aerial photographs. Hydric pine plantation (FLUCFCS 441W) and mixed forest wetland (FLUCFCS 630) were the dominant wetland ecosystems found across the study area landscape. Wetland types that differ from these two community types are the only ones specifically labeled in Appendix A - Figures 14 through 25.

Titi swamp (614) and cypress (621) wetlands were also encountered, comprising 0.45% and 1.5% of wetlands potentially involved, respectively. Titi swamps were nearly completely dominated by swamp and black titi with sweet gallberry common in the midstory. Very few of the wetlands encountered were exclusively comprised of titi but generally had a mixture of titi, pine and various hardwoods associated with the system. Certain wetland systems may have had titi as a dominant understory species but were classified as mixed forested wetland (630) since there was generally an associated canopy comprised of mixed hardwood species. Cypress wetlands were characterized by pond cypress (*Taxodium ascendens*), myrtle-leaved holly and St. Johns Wort.

Emergent tidal marsh is primarily associated with tidal streams and certain areas of East Bay and the connecting estuarine systems within the project area. Upland ecotones leading to these tidal systems are also affected by fire suppression and the overgrowth of shrub/scrub species. Depending on the specific waterbody and location, the emergent marsh systems are of relatively higher quality. More details in relation to potential emergent marsh impacts and observed quality are described in the EFH Assessment associated with the WER.

The study area also contained scrubby flatwoods and sandhill communities interspersed with wet flatwoods, titi drains, basin swamps, and cypress wetlands among other habitat types. Fire suppression in these areas is also common. These upland areas are often utilized by hunting clubs that plant and maintain small (typically < 1 acre) and widely distributed wildlife food plots.

Descriptions of FLUCFCS associated with the project are presented in the following sections.

4.2.4 Upland Communities

A brief description of upland communities by FLUCFCS type is presented below. There are nine (9) upland communities found within the alignment alternatives: swimming beach (181), cropland and pastureland (210), herbaceous/dry prairie (310), shrub and brushland (320), coastal scrub (322), upland coniferous forest (410), hardwood – conifer mixed (434), coniferous plantation (441) and forest regeneration areas (443) (Appendix A; Figures 14-25). FLUCFCS types that are typically highly disturbed due to land-use development such as residential, commercial and industrial uses are not included in this discussion of natural communities. A description of upland plant communities associated with Alternative Alignments is presented in (Table 4.5). Estimated upland involvement (acres) per FLUCFCS type within each Alternative Alignment and a 300-foot buffer area presented in Tables 4.6 and 4.7, respectively. In this region of Florida, the United States Army Corps of Engineers (USACE) typically requires an assessment of indirect effects within 300 feet of road/project boundaries. This 300-foot buffer was used consistently throughout the Endangered Species Biological Assessment Report (ESBAR), WER, and EFH report for GCP. While the buffer was established to address potential indirect wetland involvement, it is also being applied to upland habitat assessments in the ESBAR. Coniferous plantations (FLUCFCS 441) comprise the vast majority of upland habitat types within all the proposed alternative alignments, ranging from approximately 86% of the upland acreage contained in Alternative Alignment 17 to approximately 97% of the upland acreage contained in Alternative Alignment 15. The FLUCFCS 441 upland community has been extensively affected by silvicultural practices and fire suppression as previously described.

Table 4.5
Upland FLUCFCS types within the Gulf Coast Parkway Alternative Alignments and 300-Foot Buffer

FLUCFCS Designation	Upland Type	Community Description
181	Swimming Beach	Recreational areas used for swimming and active user-oriented recreations.
210	Cropland and Pastureland	Includes agricultural land which is managed for the production of row or field crops and improved, unimproved and woodland pasture.
310	Herbaceous (Dry Prairie)	Includes treeless upland pasture grasslands, which are sometimes inundated.
320	Shrub and Brushland	This category includes saw palmetto, gallberry, wax myrtle, coastal scrub and other shrubs and brush. Generally, saw palmetto is the most prevalent plant cover intermixed with a wide variety of other woody scrub plant species as well as various types of short herbs and grasses.
322	Coastal Scrub	This scrub category represents a wide variety of species found in the coastal zone. Common species are saw palmetto, sand live oak, myrtle oak, yaupon holly, railroad vine (<i>Ipomoea</i> spp), sea oats (<i>Uniola paniculata</i>), sea purslane (<i>Sesuvium portulacastrum</i>), Spanish bayonet (<i>Yucca aloifolia</i>), and prickly pear (<i>Opuntia</i> spp). This cover type is generally found in dune and white sand areas.
410	Upland Coniferous Forest	Xeric habitat comprised of slash pine. Wiregrass and other non-woody groundcover species are more prevalent than in the coastal scrub. Slash pine is the dominant canopy species. Understory species include saw palmetto, wax myrtle, gallberry and other woody and herbaceous species.
434	Hardwood-Conifer Mixed	This community includes those upland forested areas in which neither conifers nor hardwoods achieve a 66 percent crown canopy dominance.
441	Coniferous Plantation	Pine forests exclusively generated by planting seedling stock or seeds characterized by high numbers of trees per acre and their uniform appearance.
443	Forest Regeneration Areas	Areas where harvested stands will be reforested through one of the various silvicultural practices prescribed in Florida's forests rather than being allocated for another land use or for abandonment.

Table 4.6
Upland Habitat (FLUCFCS) Estimated
Direct Involvement per Alternative Alignment

			Alignment		
FLUCFCS Type	8 (Acres)	14 (Acres)	15 (Acres)	17 (Acres)	19 (Acres)
210	3.8	3.8	11.4	25.3	25.3
310				1.0	1.0
320	1.4			4.2	2.9
410	5.8	3.0	3.0	2.8	2.3
434	3.1	15.6	3.1	2.2	14.7
441	378.4	452.5	551.0	252.2	318.2
443	2.4	3.4	3.1	1.1	2.2
Upland Acres Total	394.9	478.3	571.6	288.8	366.6

Table 4.7
Upland Habitat (FLUCFCS) Estimated Indirect Involvement
Within 300-Foot Buffers per Alternative Alignment

			Alignment		
FLUCFCS Type	8 (Acres)	14 (Acres)	15 (Acres)	17 (Acres)	19 (Acres)
181	2.5	2.5	2.5	2.5	2.5
210	27.2	27.2	42.0	77.1	77.1
310				4.3	4.3
320	4.5	4.1		6.7	6.3
322	0.9	0.9	0.9	0.9	0.9
410	17.3	19.4	19.4	21.1	12.6
434	10.2	29.0	9.2	7.8	26.6
441	1,170.3	1,286.9	1,450.2	723.2	789.0
443	5.0	10.1	10.8	1.9	7.0
Upland Acres Total	1,237.9	1,380.1	1,535	845.5	926.3

4.2.5 Wetland and Surface Water Communities

Twenty (20) types of wetlands (FLUCFCS) are associated with the five Alternative Alignments (Table 4.8, Figures 14 through 25 in Appendix A). FLUCFCS types include: hydric cropland and pastureland (210W), hydric pine plantations (441W), forest regeneration areas (443W), streams and waterways (510), roadside ditches (510D), Lakes (524), reservoirs (530), embayments (541), wetland hardwood forest (610), titi swamps (614), wetland coniferous forest (620), cypress (621), hydric pine savannah (626), wetland forested mix (630), vegetated non-forested wetlands (640), freshwater marshes (641), saltwater marshes (642), hydric roads (814W), hydric natural gas transmission lines (817W) and hydric powerlines (832W). Many of the natural wetland systems have been significantly altered by activities associated with land uses such as hydric pine plantations, hydric forest regeneration

areas, ditches, existing roadways, and hydric transmission lines among others. Exotic species such as Chinese tallow (*Sapium sebiferum*) are also present throughout the study area, particularly in proximity to development and roads, and have the potential to occur in wetlands within the proposed alternative alignments. Since the majority of the project is proposed as new alignment for all five alternatives, wetland impacts are unavoidable. Additional information regarding wetland community types and involvement identified within Alternative Alignments are detailed in the GCP WER.

Table 4.8
Wetland (FLUCFCS) within the Alternative Alignments

FLUCFCS Designation	NWI Designation	Wetland Type	Community Description
210W	PEM2	Hydric Cropland and Pastureland	Cropland and Pastureland that may have been drained or converted wetlands.
441W	PFO	Hydric Pine Plantation	Planted pine plantation in wetlands.
443W	PFO	Forest Regeneration Areas	Areas in which it is clearly evident the harvested stands will be reforested through various silvicultural practices that do not involve direct planting of trees. The “w” designation denotes these forest regeneration areas are wetlands.
510	R2UB	Streams and Waterways	This category includes rivers, creeks, canals and other linear water bodies. The boundary between streams and lakes, reservoirs or the ocean is the straight line across the mouth of the stream unless the mouth is more than 1 mile wide.
510D	N/A or same as class it occurs within with “d” modifier	Ditch	Man-made ditches primarily for drainage purposes associated with roads.
524	POWH	Lakes	Lakes less than 10 acres which are dominant features
530	L1UB or L2UB	Reservoirs	Man-made water impoundment areas, excluding stormwater ponds.
541	E1/2	Embayments	Embayments are bays or estuaries that open directly to the Gulf of Mexico or the Atlantic Ocean.
614	PFO6	Titi Swamps	This community is almost exclusively made up of black titi or swamp titi. Other species found include sweetbay, cypress, tupelos and a variety of wetland hardwoods.
620	PFO	Wetland Coniferous Forests	Wetland Coniferous Forests are wetlands which meet the crown closure requirements for coniferous forests and are the result of natural generation. These communities are commonly found in the interior wetlands in such as places as river flood plains, bogs, bayheads and sloughs.
621	PFO2	Cypress	This community is composed of pond cypress or bald cypress which is either pure or dominant. In the case of pond cypress, common associates are swamp tupelo, slash pine and black titi. In the case of bald cypress, common associates are water tupelo, red maple, American elm (<i>Ulmus americana</i>), overcup oak (<i>Quercus lyrata</i>) and water hickory (<i>Carya aquatica</i>). Bald cypress may be associated with laurel oak, sweetgum and sweetbay on less moist sites.
626	PFO4/PEM1	Hydric Pine Savannah	This community is an open forest with a sparse canopy of longleaf and/or slash pines with a ground cover of grasses, forbs, and wetland shrubs.

FLUCFCS Designation	NWI Designation	Wetland Type	Community Description
630	PFO	Wetland Forested Mixed	This category includes mixed wetlands forest communities in which neither hardwoods nor conifers achieve a 66 percent dominance of the crown canopy composition.
640	PEM1	Vegetated Non-forested Wetland	Include marshes and seasonably flooded basins and meadows. These communities are usually confined to relatively level, low-lying areas. This category does not include areas which have a tree cover which meets the crown closure threshold for the forested categories. Sawgrass and cattail (<i>Typha</i> spp.) are the predominant species in freshwater marshes while cordgrass and needlerush are the predominant species in the saltwater marsh communities.
641	PEM1	Freshwater Marsh	The communities included in this category are characterized by having one or more of the following species predominate: sawgrass, cattail, arrowhead (<i>Sagittaria</i> sp), maidencane, buttonbush, cordgrass, giant cutgrass (<i>Zizaniopsis miliacea</i>), switchgrass, bulrush (<i>Scirpus americanus</i> , <i>Scirpus validus</i> , <i>Scirpus robustus</i>), needlerush, common reed (<i>Phragmites communis</i> , <i>Phragmites australis</i>), and arrowroot (<i>Thalia dealbata</i> , <i>Thalia geniculata</i>).
642	EEM	Saltwater Marsh	This community is a coastal saltwater marsh that is characterized by having one or more of the following species predominate: saltwort (<i>Batis maritima</i>), glasswort (<i>Salicornia</i> spp.), fringe rush (<i>Fimbristylis</i> spp.), salt dropseed (<i>Sporobolus virginicus</i>), seaside daisy (<i>Borrchia frutescens</i>), black needle rush, and salt jointgrass (<i>Paspalum vaginatum</i>).
814W	PEM1	Hydric Road	Roadway/unimproved trail that is not paved and traversed through wetlands. Certain lengths of the roadway are considered jurisdictional wetlands.
817W	PEM1	Oil, Water, or Gas Long Distance Transmission Lines	Utility long distance transmission facilities through wetland systems that are typically maintained and commonly support heighten diversity of plant species due to overstory competition reduction.
832W	PEM1	Hydric Powerlines	Powerline facilities through wetland systems that are typically maintained and commonly support height diversity of plant species due to overstory competition reduction.

4.2.6 Wetland Involvement per Alternative Alignment

Individual Alternative Alignment footprints range between 835 and 1,318 acres. Wetlands account for approximately 45% (range of 35 - 55%) of the total alignment acreage. Direct involvement with wetlands and surface waters (creeks, streams, and ditches) will occur as a result of roadway construction activities for all Alternative Alignments since a significant

amount of each alignment involves new alignment and right-of-way that must be acquired. Overall, based on acres and/or relative quality, Alternative Alignment 8 had the lowest wetland involvement while Alignment 19 had the highest.

Table 4.9
Total Wetland and Upland Acreage per Alternative Alignment

Alignment					
Land Type	8 (Acres)	14 (Acres)	15 (Acres)	17 (Acres)	19 (Acres)
Wetlands	339.3	503.6	508.2	438.7	575.1
Uplands	394.9	478.3	571.6	288.8	366.6
Total	734.2	981.9	1,079.8	727.5	941.7

A 300-foot buffer (each side) was applied to each Alternative Alignment in order to facilitate an assessment of ICE for certain environmental elements under study. Wetlands account for approximately 50 % (range of 42 - 59%) of the total alignment acreage associated with buffer areas (Table 4.10). As was the case for direct wetland involvement, Alternative Alignment 8 had the lowest potential indirect involvement and Alternative Alignment 19 had the highest.

Table 4.10
Total Wetland and Upland Acreage per
Alternative Alignment with 300 Foot Buffer

Alignment					
Land Type	8 (Acres)	14 (Acres)	15 (Acres)	17 (Acres)	19 (Acres)
Wetlands	1,064.9	1,430.6	1,506.1	1,237.2	1,541.7
Uplands	1,237.9	1,380.1	1,535.0	845.5	926.3
Total	2,302.8	2,810.7	3,041.1	2,082.7	2,468.0

SECTION 5 RATIONALE FOR THREATENED AND ENDANGERED SPECIES CONSIDERATIONS

5.1 THREATENED AND ENDANGERED SPECIES DATA

Project alternative alignments were evaluated for the potential occurrence of federal and state listed (threatened and endangered {T&E}) species. Literature reviews were conducted and data collected from the USFWS, the National Marine Fisheries Service (NMFS), the Florida Fish and Wildlife Conservation Commission (FFWCC), the Florida Marine Research Institute (FMRI), and the Florida Natural Areas Inventory (FNAI). Species protected under the Migratory Bird Treaty Act, Marine Mammals Protection Act, and the Fish and Wildlife Conservation Act were also considered.

Information sources and databases utilized include the following:

- USFWS Species List for Bay, Gulf, and Calhoun Counties
- FNAI Element Occurrence (EO) Data (publically available)
- FNAI Report was requested on September 24, 2007 and received on October 2, 2007; a revised version was received on October 15, 2007 (can be made available upon request).
- FNAI-The Nature Conservancy (TNC) 2001 (FNAI- TNC Report 2001). Rare Plant Conservation through Private Action: Final Report to USFWS (agreement 1448-40181-98-J-016).
- FFWCC Eagle Locator
- FFWCC Water Bird Colony Data
- USDA, NRCS, Soil Survey Geographic (SSURGO) database for Bay County, Florida, 2006 <http://SoilDataMart.nrcs.usda.gov/>
- USDA, NRCS, SSURGO database for Gulf County, Florida, 2006 <http://SoilDataMart.nrcs.usda.gov/>
- USDA, NRCS, SSURGO database for Calhoun County, Florida, 2006 <http://SoilDataMart.nrcs.usda.gov/>
- USFWS NWI Database
- USFWS Classification of Wetlands and Deepwater Habitats of the United States (1979)
- NFWFMD, FLUCFCS data (1995)

- Aerial photographs of the project area from 1953, 2004, and 2007
- USGS Topographic Quadrangle maps, 7.5 minute series
- FDOT, FLUCFCS, Level III, third ed., 1999.

Wildlife occurrence and potential utilization analysis of the project area was primarily desktop-based, applying information obtained from the FFWCC and FNAI. The following data sets were obtained from the FFWCC and reviewed:

- *Florida Vegetation and land cover March 2004*
- *Integrated Wildlife Habitat Ranking System 2007*
- *Selected wildlife conservation GIS data layers June 2007*
- *Wildlife conservation projects – GIS data layers July 2007*
- *Wildlife Habitat Conservation Needs in Florida: Updated Recommendations for Strategic Habitat Conservation Areas August 2007.*

5.1.1 Species descriptions and background

The USFWS documents 122 listed species (57 animals and 65 plants) potentially occurring in Bay, Gulf, and Calhoun Counties (Table 5.1). This species list is expansive and represents a “first approximation” of species that could be potentially involved with Alternative Alignments. For example, the USFWS maintains a county list of species that are classified as threatened, endangered, and/or “other species of concern”. Species in this final category are typically designated as “consideration encouraged”. Based on discussions with USFWS and FFWCC, it was determined that species designated as “consideration encouraged” should be reviewed during initial project planning. In addition, it should be noted that several species listed for Calhoun County may not have direct involvement with Alternative Alignments, since only a relatively short section of Alternative Alignment 15 crosses into Calhoun County (Figure 1 in Appendix A). Therefore, species such as listed mussels may be located in watersheds that are not directly or indirectly affected by Alternative Alignments.

Brief descriptions of the species listed in Table 5.1 are found below.

Table 5.1
Protected Species Potentially Occurring in Counties
of the Gulf Coast Parkway Study Area.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	COUNTY OCCURRENCE
<u>FISH</u>				
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	T CH	SSC	Bay, Gulf, Calhoun
<i>Cyprinella callitaenia</i>	Bluestripe shiner		CE	Bay, Gulf
<i>Micropterus sp.</i>	Shoal bass		SSC	Bay
<i>Pteronotropsis welaka</i>	Bluenose shiner		SSC	Bay, Gulf
<u>AMPHIBIANS and REPTILES</u>				
<i>Alligator mississippiensis</i>	American alligator	T SA	SSC	Bay, Gulf, Calhoun
<i>Ambystoma bishopi</i>	Reticulated flatwoods salamander (RFS)	T	SSC	Bay, Gulf, Calhoun
<i>Caretta caretta</i>	Loggerhead	T	T	Bay, Gulf
<i>Chelonia mydas</i>	Green sea turtle	E	E	Bay, Gulf
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	E	Bay, Gulf
<i>Drymarchon corais couperi</i>	Eastern indigo snake	T	T	Bay, Gulf, Calhoun
<i>Eretmochelys imbricata imbricata</i>	Hawksbill sea turtle	E	E	Bay, Gulf
<i>Eumeces anthracinus</i>	Coal skink		CE	Gulf, Calhoun
<i>Gopherus polyphemus</i>	Gopher tortoise	CE	T	Bay, Gulf, Calhoun
<i>Graptemys barbouri</i>	Barbour's map turtle	CE	SSC	Gulf, Calhoun
<i>Lepidochelys kempii</i>	Kemp's ridley sea turtle	E	E	Bay, Gulf
<i>Macrochelys temminckii</i>	Alligator snapping turtle	CE	SSC	Bay, Gulf, Calhoun
<i>Nerodia clarkii clarkii</i>	Gulf saltmarsh snake		CE	Bay, Gulf
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	CE	SSC	Bay, Gulf, Calhoun
<i>Pseudemys concinna suwanniensis</i>	Suwannee cooter		SSC	Gulf, Calhoun
<i>Rana capito</i>	Gopher frog	CE	SSC	Bay, Gulf, Calhoun

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	COUNTY OCCURRENCE
<u>BIRDS</u>				
<i>Aimophila aestivalis</i>	Bachman's sparrow		CE	Bay, Gulf
<i>Aramus guarana</i>	Limpkin		SSC	Gulf, Calhoun
<i>Calidris canutus</i>	Red knot	C		Bay, Gulf
<i>Charadrius alexandrinus tenuirostris</i>	Southeastern snowy plover	CE	T	Bay, Gulf
<i>Charadrius melodus</i>	Piping plover	T, CH	T	Bay, Gulf
<i>Cistothorus palustris marianae</i>	Marian's marsh wren		SSC	Bay
<i>Dendroica dominica stoddardi</i>	Stoddard's yellow-throated warbler	CE		Bay
<i>Egretta caerulea</i>	Little blue heron		SSC	Bay, Gulf, Calhoun
<i>Egretta thula</i>	Snowy egret		SSC	Gulf
<i>Egretta tricolor</i>	Tricolored heron		SSC	Bay, Gulf, Calhoun
<i>Falco peregrinus tundrus</i>	Artic peregrine falcon	CE	E	Bay, Gulf, Calhoun
<i>Falco sparverius paulus</i>	Southeastern American kestrel	CE	T	Bay, Gulf, Calhoun
<i>Grus canadensis pratensis</i>	Florida sandhill crane		T	Gulf
<i>Haematopus palliatus</i>	American oystercatcher		SSC	Gulf
<i>Haliaeetus leucocephalus</i>	Bald eagle	BGEPA, MBTA		Bay, Gulf, Calhoun
<i>Mycteria americana</i>	Wood stork	E	E	Bay, Gulf, Calhoun
<i>Pelecanus occidentalis</i>	Brown pelican		SSC	Bay, Gulf
<i>Picoides borealis</i>	Red-cockaded woodpecker (RCW)	E	SSC	Bay, Gulf, Calhoun
<i>Rynchops niger</i>	Black skimmer		SSC	Bay, Gulf, Calhoun
<i>Sterna antillarum</i>	Least tern		T	Bay, Gulf
<u>MAMMALS</u>				
<i>Peromyscus polionotus allophtys</i>	Choctawhatchee beach mouse	E, CH	E	Bay
<i>Peromyscus polionotus peninsularis</i>	St. Andrew beach mouse	E, CH	E	Bay, Gulf

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	COUNTY OCCURRENCE
<i>Plecotus rafinesquii</i>	Southeastern big-eared bat		CE	Gulf, Calhoun
<i>Trichechus manatus latirostris</i>	West Indian manatee	E	E	Bay, Gulf
<i>Ursus americanus floridanus</i>	Florida black bear	CE	T	Bay, Gulf, Calhoun
<u>INVERTEBRATES</u>				
<i>Alasmidonta triangulata</i>	Southern elktoe (mussel)	CE		Calhoun
<i>Amblema neislerii</i>	Fat threeridge	E	CE	Bay, Calhoun
<i>Anodonta heardi</i>	Apalachicola floater	CE		Calhoun
<i>Anodontoides radiates</i>	Rayed creekshell	CE		Gulf, Calhoun
<i>Elliptio chipolaensis</i>	Chipola slabshell	T, CH		Gulf, Calhoun
<i>Elliptioideus sloatianus</i>	Purple bankclimber	T, CH		Gulf, Calhoun
<i>Hamiota subangulata</i>	Shinyrayed pocketbook	E, CH		Gulf, Calhoun
<i>Medionidus penicillatus</i>	Gulf moccasinshell	E, CH		Bay, Gulf, Calhoun
<i>Pleurobema pyriforme</i>	Oval pigtoe	E, CH		Bay, Gulf, Calhoun
<i>Procambarus econfinae</i>	Panama City crayfish (PCC)	CE	SSC	Bay
<i>Quadrula infucata</i>	Sculptured pigtoe	CE		Gulf, Calhoun
<i>Villosa villosa</i>	Downy rainbow	CE		Bay, Gulf, Calhoun
<u>PLANTS</u>				
<i>Arnoglossum album</i>	White Indian plantain	CE	E	Bay, Gulf
<i>Asclepias viridula</i>	Southern milkweed	CE	T	Bay, Gulf
<i>Baptisia megacarpa</i>	Apalachicola wild indigo		E	Bay, Calhoun
<i>Boltonia apalachicolensis</i>	Apalachicola dolls daisy	CE		Gulf
<i>Bumelia thornei</i>	Buckthorn	CE	E	Gulf
<i>Bumelia lycioides</i>	Buckthorn	CE	E	Calhoun
<i>Calamovilfa curtissii</i>	Curtiss' sandgrass	CE	T	Bay
<i>Calycanthus floridus</i>	Sweet-shrub		E	Bay
<i>Carex baltzellii</i>	Baltzell's sedge	CE	T	Bay, Calhoun
<i>Chrysopsis gossypina ssp. Cruiseana</i>	Cruise's goldenaster	CE	E	Bay

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	COUNTY OCCURRENCE
<i>Cleistes divaricata</i>	Rosebud orchid or spreading pagonia		T	Bay
<i>Cornus alterniflora</i>	Alternate-leaf or pagoda dogwood		E	Bay, Calhoun
<i>Cuphea aspera</i>	Tropical waxweed	CE		Gulf, Calhoun
<i>Drosera filiformis</i>	Dew-thread		E	Bay
<i>Drosera intermedia</i>	Spoon-leaved sundew		T	Bay, Gulf, Calhoun
<i>Eriocaulon nigrobacteatum</i>	Dark-headed hatpin	CE		Bay, Gulf, Calhoun
<i>Euphorbia telephioides</i>	Telephus spurge	T	E	Bay, Gulf
<i>Eurybia spinulosus</i>	Pine-woods aster	CE	E	Bay, Gulf, Calhoun
<i>Gentiana pennelliana</i>	Wiregrass gentian	CE	E	Bay, Gulf, Calhoun
<i>Harperocallis flava</i>	Harper's beauty	E	E	Bay, Gulf, Calhoun
<i>Hymenocallis henryae</i>	Henry's spiderlily	CE	E	Bay, Gulf
<i>Hypericum lissophloeus</i>	Smooth-barked St. John's wort	CE	E	Bay
<i>Justicia crassifolia</i>	Thick-leaved water willow	CE	E	Bay, Gulf
<i>Kalmia latifolia</i>	Mountain laurel		T	Bay, Calhoun
<i>Lilium catesbaei</i>	Southern red lily		T	Bay, Gulf, Calhoun
<i>Linum sulcatum var harperi</i>	Harper's grooved yellow flax	CE	E	Gulf
<i>Linum westii</i>	West's flax	CE	E	Gulf, Calhoun
<i>Lupinus westianus</i>	Gulf coast lupine	CE	T	Bay, Gulf
<i>Lythrum curtissii</i>	Curtiss' loosestrife	CE	E	Bay, Calhoun
<i>Macbridea alba</i>	White birds-in-a-nest	T	E	Bay, Gulf
<i>Macranthera flammea</i>	Hummingbird flower		E	Bay, Calhoun
<i>Magnolia ashei</i>	Ashe's magnolia		E	Bay
<i>Magnolia pyramidata</i>	Pyramid magnolia		E	Bay, Calhoun
<i>Oxypolis filiformis greenmanii</i>	Giant water-dropwort		E	Bay, Gulf, Calhoun

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	COUNTY OCCURRENCE
<i>Paronychia chartacea</i> ssp. <i>minima</i>	Crystal lake nailwort	T	E	Bay
<i>Physocarpus opulifolius</i>	Eastern ninebark		E	Calhoun
<i>Pinckneya bracteata</i>	Hairy fever tree		T	Bay
<i>Pinguicula ionantha</i>	Godfrey's butterwort	T	E	Bay, Gulf, Calhoun
<i>Pinguicula lutea</i>	Yellow butterwort		T	Bay, Gulf
<i>Pinguicula planifolia</i>	Chapman's butterwort	CE	T	Bay, Gulf, Calhoun
<i>Pinguicula primulifolia</i>	Primrose-flower butterwort		E	Bay
<i>Pityopsis flexuosa</i>	Bent golden aster	CE	E	Bay, Gulf
<i>Platanthera ciliaris</i>	Yellow fringed orchid		T	Bay, Gulf, Calhoun
<i>Platanthera integra</i>	Yellow fringeless orchid	CE	E	Bay, Gulf, Calhoun
<i>Platanthera nivea</i>	Snowy orchid		T	Bay, Gulf, Calhoun
<i>Polygonella macrophylla</i>	Large-leaved jointweed	CE	T	Bay
<i>Rhexia parviflora</i>	Small-flowered meadowbeauty	CE	E	Bay, Gulf, Calhoun
<i>Rhododendron austrinum</i>	Orange azalea		E	Calhoun
<i>Rhododendron chapmanii</i>	Chapman's rhododendron	E	E	Gulf
<i>Rudbeckia nitida</i>	St. John's black-eyed susan	CE	E	Bay
<i>Sarracenia leucophylla</i>	White-top pitcher plant	CE	E	Bay, Gulf, Calhoun
<i>Sarracenia minor</i>	Hooded pitcher plant		T	Gulf
<i>Sarracenia psittacina</i>	Parrot pitcher plant		T	Bay, Gulf, Calhoun
<i>Sarracenia purpurea</i>	Decumbant pitcher plant		T	Bay, Gulf, Calhoun
<i>Scutellaria floridana</i>	Florida skullcap	T	E	Bay, Gulf
<i>Sideroxylon thornei</i>	Thorne's buckthorn		E	Gulf, Calhoun
<i>Spigelia gentianoides</i>	Gentian pinkroot	E	E	Calhoun
<i>Spiranthes laciniata</i>	Lace-lip		T	Bay
<i>Stachydeoma graveolens</i>	Mock pennyroyal		E	Bay
<i>Stewartia malacodendron</i>	Silky camellia		E	Bay, Calhoun
<i>Verbesina chapmanii</i>	Chapman's crownbeard	CE	T	Bay, Gulf, Calhoun
<i>Xyris drummondii</i>	Drummond's yellow-eyed grass	CE		Bay, Gulf

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	COUNTY OCCURRENCE
<i>Xyris isoetifolia</i>	Quillwort yellow-eyed grass	CE		Bay, Gulf
<i>Xyris longisepala</i>	Karst (Kral's) pond xyris		E	Bay
<i>Xyris scabrifolia</i>	Harper's yellow-eyed grass	CE	T	Bay, Gulf, Calhoun

Abbreviations used in the table: E=endangered, T=threatened, P=proposed, C=candidate, SA=similar appearance, SSC=species of special concern, CE=consideration encouraged, CH=Critical Habitat, BGEPA=Bald and Golden eagle protection Act, MBTA = Migratory Bird Treaty Act

5.1.2 Fish

Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is a large sturgeon, generally reaching 5 to 7.5 feet in length (some specimens have been recorded reaching 9.5 feet in length). Gulf sturgeons forage in the Gulf of Mexico and associated estuaries and spawn in most major coastal rivers in areas with limestone outcrops. The Gulf sturgeon is anadromous; adults and subadults spend the coldest three to four months in the Gulf and the remainder of the year in rivers where spawning occurs. The Gulf sturgeon is listed as a species of special concern by the FFWCC and is listed as threatened by the USFWS. No Critical Habitat for the Gulf sturgeon is associated with the project area (Figures 26-29 in Appendix A).

Bluestripe shiner (*Cyprinella callitaenia*) is an elongate, slender minnow with a slightly compressed body. The head is small, with an inferior, oblique mouth and a long, blunt snout. Adult size ranges from 2 to 3 in. (50 to 75 mm). Habitat consists of sandy and rocky runs of small to medium rivers, reservoirs, and large tributaries with slow to moderate currents over sand and gravel substrates. This species is endemic to the Apalachicola River basin, where it occurs throughout the Chattahoochee and Flint River drainages. The bluestripe shiner is not listed by the FFWCC and the USFWS encourages consideration during project planning.

Shoal bass (*Micropterus spp.*) is a medium to large bass, up to 25 inches long. The shoal bass is olive-green to nearly black dorsally, with dark olive, vertically elongate blotches that often create a distinctive "tiger-striped" pattern along the sides. Habitat consists of fast-moving shoal areas of rivers and larger tributaries. Florida distribution includes limestone shoal areas of Chipola and Apalachicola Rivers. However, the range-wide distribution extends throughout the Apalachicola-Chattahoochee-Flint Rivers basin in Alabama, Georgia, and Florida. This species is listed as a species of special concern by the FFWCC and is not listed by the USFWS.

Bluenose shiner (*Pteronotropis welaka*) is a small shiner measuring 1.3 to 1.9 inches long. This species is olive-colored with a dark lateral stripe bordered above by a narrow amber stripe, a dark caudal spot highlighted by light-colored areas above and below, and a blue "nose" (adults only). Adult males have large, darkly pigmented dorsal fins and yellow pelvic and anal fins streaked with black. Habitat consists of quiet backwaters and pools of blackwater streams and rivers, usually associated with thick vegetation. The Bluenose shiner is listed as a species of species concern by the FFWCC and is not listed by the USFWS.

5.1.3 Reptiles and Amphibians

American alligator (*Alligator mississippiensis*) is a large, mostly black crocodilian with a broadly rounded snout. The young have yellow crossbands on the back, tail, and sides. The throat and belly are white to creamy yellow at all ages. The head is smooth in front of the eyes. There is no prominently visible dentation in lower jaw when mouth is closed. Adults are 6 to 15 feet long and hatchlings are about 9 inches long. The American alligator can be found in most permanent bodies of freshwater in the State of Florida including marshes. The American alligator will venture into brackish water but will not usually remain there. (Hipes D, et al., 2000) The American alligator is listed as a species of special concern by the FFWCC and is listed as threatened by the USFWS due to the similar appearance to the American crocodile, which is restricted to southern Florida.

Reticulated flatwoods salamander (RFS) (*Ambystoma bishopi*) is a small to medium-sized salamander with a delicate white to silvery-gray pattern that may resemble nets, lichens, or narrow lines and rings on a black background. The belly is black with scattered or many small gray spots. Breeding occurs within small, isolated ephemeral ponds, generally less than 10 acres in size (Federal Register, February 2009) that lack predatory fish. Sustainable habitat includes breeding ponds and their immediate boundary/ecotone, which are characterized by herbaceous vegetation and scattered shrubs that are contiguous with adjacent pine flatwoods. Migration to breeding sites such as ephemeral habitats like ditches, borrow pits, marshy ponds, and swamps is triggered by rainy weather from mid October to early February. Females lay 1-34 eggs in linear or clumped arrangements beneath logs, leaf litter, sphagnum mats, bare soil, bases of bushes, and at the entrances of crayfish burrows. Larvae hatch 3-5 weeks later. RFS inhabit hydric pine savanna and pine flatwoods (longleaf and/or slash pine) communities that have native groundcover normally dominated by wiregrass or dropseed (Federal Register, February 2007). Flatwoods salamanders (FWS) are usually nocturnal, living mainly underground in burrows or in cool, damp crevices under rocks or logs, in root channels, or in crayfish burrows (Conant & Collins 1998). The FWS is a carnivorous, opportunistic feeder, and feeds primarily on small worms, beetle larvae, and termites.

As described in the 2009 final rule, the major threat to the RFS is loss of both its longleaf/slash pine flatwoods terrestrial habitat and its isolated seasonally ponded breeding habitat. Within the GCP study area, virtually all of the former pine flatwoods have been converted to pine plantations. Conversion of pine flatwoods to intensively managed pine plantations (use of heavy mechanical site preparation, high pine stocking rates, and infrequent fires) results in degradation of RFS habitat by creating highly-shaded, closed canopied forests with an understory dominated by shrubs and pine needles. Some forest management practices such as bedding may adversely affect RFS by altering soil surface layers, site hydrology, and understory/groundcover species composition and structure (Federal Register 2009).

The RFS is listed as endangered by the USFWS and a species of special concern by the FFWCC. On February 10, 2009, the USFWS issued a final rule in the Federal Register changing the classification from one species to two: the RFS (*Ambystoma bishopi*), found only west of the Apalachicola River, and the frosted flatwoods salamander (*Ambystoma*

cingulatum), found only east of the Apalachicola River. In addition, USFWS designated the RFS as endangered. The 2009 final rule also designated ten units of Critical Habitat for the RFS encompassing approximately 7,496 acres. No Critical Habitat was designated in Bay or Gulf Counties and three (3) critical habitat units were proposed for Calhoun County (Figures 27-29 in Appendix A). No Critical Habitat is associated with the project area. The closest Critical Habitat area (RFS-9; Subunit A) is located approximately six miles east of the northeastern leg of Alternative Alignment 15 in Calhoun County.

Loggerhead sea turtle (*Caretta caretta*) is a large sea turtle with a reddish-brown carapace (upper shell) and large, blunt head with yellow cheeks. The front limbs are reddish-brown and modified as flippers. The carapace has five or more large scales (costal scutes) on each side. The lower shell (plastron) is yellow and usually without a single small scale at its posterior tip. There are two pairs of scales (pre-frontals) between the eyes. Adults have a 28 to 49 inches carapace length and weigh between 170 to 350 lbs. Habitat consists of marine coastal and oceanic environments with nesting occurring on sand beaches near the dune line. The loggerhead is listed as threatened by the USFWS and FFWCC.

Green turtle (*Chelonia mydas*) is a large sea turtle that is dark above, light below, and bears only a single pair of elongate scales (prefrontals) between the eyes. The front limbs are modified as flippers. The upper shell (carapace) of the adult is olive with dark spots, while the upper shell of the juvenile is brown to olive with radiating lines. The carapace does not have a central keel except in young. The lower shell (plastron) is cream to yellow in color. Adults have shell length of 35 to 48 inches and weigh between 220 to 450 lbs. Habitat consists of marine coastal and oceanic environments with nesting occurring on sand beaches near the dune line. The green turtle is listed as endangered by the USFWS and FFWCC.

Leatherback sea turtle (*Dermochelys coriacea*) is a large sea turtle with a dark gray to black body covered by leathery skin and bearing seven prominent longitudinal ridges. Five similar ridges occur on the mostly white lower shell (plastron). The front limbs are modified as flippers. Adults typically reach 53 to 70 inches in shell length and weigh 650 to 1,300 lbs. Young are black dorsally with white ridges and are covered by small beady scales. Habitat consists of oceanic waters. Leatherbacks are rarely seen in coastal waters. Nesting occurs on sand beaches near the dune line. The leatherback turtle is listed as endangered by the USFWS and FFWCC.

Hawksbill turtle (*Eretmochelys imbricata imbricata*) is a medium-sized sea turtle with a brown, somewhat heart-shaped upper shell (carapace), often marked with a “tortoiseshell” pattern of light and dark streaks. Front limbs are modified as flippers, upper jaw is narrowly pointed as a beak, and two pairs of scales (prefrontals) are found between the eyes. Unlike other sea turtles, large scales of carapace overlap except in extremely young and extremely old hawksbills. Adults are typically 25 - 37 inches long and weigh between 95 - 165 lbs. (record is 280 lbs.). Hatchlings are brown to black above, 1.5 - 1.9 inches long, with one central ridge on back and pair of ridges below. Habitat consists of marine coastal and oceanic waters, commonly associated with coral reefs, keys, and mangroves and nests on coastal sand beaches, often in vegetation. The hawksbill turtle is listed as endangered by the USFWS and FFWCC.

Kemp's ridley (*Lepidochelys kempii*) is a small to medium-sized sea turtle with a nearly circular shell. The front limbs are modified as flippers. The upper shell (carapace) is olive-green to gray, with five large scales (costal scutes) on each side. The lower shell (plastron) is yellow to white and usually with a single, small scale (the internal) at its posterior tip. Adults reach 23 to 28 inches in shell length and weigh 70 to 100 lbs. Habitat consists of marine coastal waters usually with sand or mud bottoms. This species nests on sandy beaches, but rarely in Florida. Kemp's ridley is listed as endangered by the FFWCC and endangered by the USFWS.

Eastern indigo snake (*Drymarchon corais couperi*) is listed as threatened by the USFWS and FFWCC. The eastern indigo snake inhabits dry scrub, sandhills, wet prairies, and hydric hardwood hammocks. During winter, snakes have been observed almost exclusively in or near gopher tortoise burrows on sandhills (Hallum, C. et al. 1998). It is suspected that indigo snakes reside in creek bottom thickets, upland pine-hardwood forest, mixed hardwood forest, and agricultural fields during spring and fall (Speake et al. 1978). However, foraging is most likely done in hydric habitats during daylight hours (Schaefer and Junkin 1999). Breeding occurs between the months of November and March, with eggs hatching from late July through October, mostly within inactive gopher tortoise burrows (USFWS 1992).

Gulf saltmarsh snake (*Nerodia clarkii clarkii*) is a small to medium-sized (maximum 2 feet) water snake marked by a pattern of dark brown and light stripes anteriorly but dark blotches on a pale olive ground color over much of the rest of the body. Scales strongly keeled and arranged in 21 - 23 rows; anal scale divided; double row of scales under tail. Habitat is estuarine areas such as coastal salt marshes, mangrove swamps, tidal creeks, pools, and ditches. The Gulf saltmarsh snake is not listed by the FFWCC and the USFWS encourages consideration during project planning.

Florida pine snake (*Pituophis melanoleucus mugitus*) is a large, stocky, tan or rusty colored snake with an indistinct pattern of large blotches on a lighter background. The blotches are more distinct posteriorly. The under belly is white but may be dark brown in far western panhandle, where it intergrades with another subspecies. The body is muscular, with keeled scales and an undivided anal scale. Head is relatively small, snout, and somewhat pointed. The adults are 4 to 7 feet or longer. Habitat consists of relatively open canopies and dry sandy soils, in which it burrows. Sandhill and former sandhill, including old fields and pastures, but also sand pine scrub and scrubby flatwoods are preferred. This species often coexists with pocket gophers and gopher tortoises. The Florida pine snake is listed as a species of special concern by the FFWCC and is not listed by the USFWS.

Coal skink (*Eumeces anthracinus*) is a mid-sized lizard with short legs and a streamlined body approximately 5 - 7 inches. The body is generally gray or brown with four white or yellowish stripes (two on each side). This species is most often found along stream edges and often shelters under rocks, logs, or other cover. When disturbed, coal skinks often dive into water and hide beneath rocks or other aquatic debris. Coal skinks occur in disjunct populations throughout the southeast; however, the Florida population occurs exclusively

within the northwest panhandle counties. The coal skink is not listed by the FFWCC and the USFWS encourages consideration during project planning.

Gopher tortoise (*Gopherus polyphemus*) can occupy a variety of habitats but typically is found in dry, upland habitats, including pine flatwoods, longleaf pine-turkey oak sandhills, scrub, coastal strand, xeric oak hammock, and dry pine flatwoods, pastures, old fields and road shoulders. Tortoises prefer sandy soils where the surficial water table does not approach the ground surface. Gopher tortoises excavate deep burrows for refuge from predators, weather, and fire (FNAI 2001). Tortoise burrows also afford refuge to more than 360 animal species, including the indigo snake, pine snake, gopher frog, Florida mouse, opossum, armadillo, burrowing owl, gopher cricket, scarab beetle, and many others. Gopher tortoises feed mainly on low-growing plants that require abundant sunlight. Although grasses and legumes make up the bulk of their diet, gopher tortoises eat a large variety of herbaceous plants including gopher apple, pawpaw, blackberries, saw palmetto berries, and other fruits. Periodic natural fires play an important role in maintaining tortoise habitat by opening up the canopy and promoting growth of herbaceous food plants. If natural fires are suppressed, habitats may become unsuitable for tortoises (Gopher Tortoise Council). Vegetative conditions require enough ground cover to provide a food source. FFWCC classifies the gopher tortoise as a threatened species, which requires the protection of all gopher tortoises and their burrows located within 25 feet of development activities. The gopher tortoise in Florida does not currently have a federal listing; however, its status is currently under review by the USFWS.

Barber's map turtle (*Graptemys barbouri*) is a small turtle with young and male map turtles being readily identified by a series of spines on raised keel along middle of back. Spines are reduced to knobs in adult females, which grow considerably larger (to 11 inches shell length) than males (to 6 inches) and develop massive heads for crushing mollusks. Shells of both sexes are gray to olive above, sometimes with a fine yellow-orange ring or C on each scale, and pale yellow below. Habitat consists of rivers, large streams, and impoundments, usually favoring areas with good flow and avoiding backwaters. Nesting occurs along sand bars, river berms, and spoil mounds. Though long thought to be restricted to the Apalachicola River system, including Chipola River, recent observations have confirmed this turtle's presence in Choctawhatchee and Ochlockonee Rivers as well. Whether this is a result of human introduction is unknown, but fossils document a past distribution that included Suwannee River system. This species ranges downstream in the Apalachicola River to tidewater influenced areas, well south of Forbes Island. Barber's map turtle is listed as a species of special concern by the FFWCC and the USFWS encourages consideration during project planning.

Alligator snapping turtle (*Macrolemys temminckii*) is a freshwater turtle reaching immense proportions. Adult males are as large as 30 inches in shell length and weigh up to 200 lbs. Females are smaller (to 24 inches). Both common and alligator snapping turtles have rough brown shells and very long tails, nearly as long as body. The alligator snapping turtle has three sharp ridges or keels that run length of upper shell (carapace). The very large head that is roughly triangular from above with a strongly hooked beak and a mouth that is brownish-gray inside. Alligator snapping turtles are native to the southeastern region of the

United States. They are confined to the river systems that drain into the Gulf of Mexico. This species generally lives in the deep water of large rivers, canals, lakes, and swamps. Hatchlings and juveniles usually live in small streams. The alligator snapping turtle is listed by the FFWCC as a species of special concern and is not listed by the USFWS.

Suwannee cooter (*Pseudemys concinna suwanniensis*) is a medium-sized to large (up to 17 inches shell length) freshwater basking turtle characterized by a nearly black upper shell (carapace) with fine yellow markings, and an orange-yellow lower shell (plastron) with a variable amount of black pigment (often fading in adults) along the seams between scales. Fine yellow lines are found midway along the carapace (on the large costal scales) often in form of concentric circles or backward-facing “C’s”. Bridge and underside of carapacial rim typically have a complete set of black spots, often containing concentric yellow circles. Habitat consists of rivers and large streams, including alluvial, blackwater, and spring-run streams, often with dense aquatic vegetation upon which species feeds. This species occasionally enters estuaries at river mouths, basks extensively on logs and floating vegetation mats, and nests on high banks and sandbars above floodplain. The Suwannee cooter is listed as a species of special concern by the FFWCC and not listed by the USFWS.

Gopher frog (*Rana capito*) is a small frog that utilizes gopher tortoise burrows, mouse burrows, stump holes, and post holes in dry, sandy uplands, chiefly sandhill and scrub habitats where gopher tortoises are found (Beever 2003). These frogs are usually nocturnal. In the breeding season, February through April, gopher frogs congregate at night in shallow, vegetated ponds to breed (Fogarty 1978b). Preferred breeding habitats include seasonally-flooded grassy ponds and cypress heads that lack predatory fish populations (Godley 1992). Habitats surrounding known breeding ponds include flatwoods, scrubby flatwoods, scrub, sandhills, and disturbed xeric oak hammock. Breeding ponds in wet flatwoods are usually located within 0.5 km of sand ridges vegetated with upland plants, and it is suspected that the gopher frog populations reside on these dry sites and migrate through the less favorable intervening habitats to ponds (Franz and Smith 1999). The gopher frog is listed by the FFWCC as a species of special concern and the USFWS encourages consideration during project planning.

5.1.4 Birds

Bachman’s sparrow (*Aimophila aestivalis*) is a large sparrow with a flat forehead, a long, dark, rounded tail, and a thin dark line extending back from the eye. Its gray upperparts are heavily streaked with chestnut or dark brown. This sparrow can be found in areas with scattered scrubby vegetation and a dense understory, with or without a tree overstory. They are found in dry open pine or oak woods with an undercover of grasses and shrubs; brushy or overgrown hillsides; or overgrown fields with thickets and brambles. This species is not listed by the FFWCC and the USFWS encourages consideration during project planning.

Limpkin (*Aramus guarauna*) is a large, long-billed, long-legged wading bird of swamps and marshes. The coloration is a deep brown with white spotting and streaking. The bill is heavy and slightly de-curved, allowing easy access to its preferred food, the apple snail (*Pomacea paludosa*). Habitat consists of mangroves, freshwater marshes, swamps, springs and spring runs, and pond and river margins. Though not uncommon, the limpkin is an

infrequent visitor to the western Florida panhandle. Distribution includes scattered locations throughout the panhandle and north Florida but generally wide-spread throughout central and south Florida. This species is listed as a species of special concern by the FFWCC and is not listed by the USFWS.

Red knot (*Calidris canutus*) is a large, bulky sandpiper with a relatively short, straight bill tapering to the tip. The legs are short and thick with a head and breast reddish in breeding plumage, gray the rest of the year. Habitat outside of breeding season is found primarily in intertidal, marine habitats, especially near coastal inlets, estuaries, and bays. The red knot breeds in drier tundra areas, such as sparsely vegetated hillsides. It makes one of the longest yearly migrations of any bird, traveling 9,300 miles from its Arctic breeding grounds to Tierra del Fuego in southern South America. The red knot feeds on invertebrates, especially bivalves, small snails, and crustaceans. During the breeding season, it also eats terrestrial invertebrates. This species is not listed by the FFWCC, however, is listed as a candidate species by the USFWS.

Southeastern snowy plover (*Charadrius alexandrinus*) is a small plover with a slim, dark bill, dark ear patch, and dark legs. This species is extremely pale gray or brownish above with dark collar patches on each side of breast and a black band across its forehead. The dark collar or neck-ring, head, and ear markings are less prominent in females and become indistinct in winter birds and juveniles. Habitat consists of dry sandy beaches for nesting. Foraging occurs on tidal flats along inlets and creeks. This species is listed as threatened by the FFWCC and the USFWS encourages consideration during project planning.

Piping plover (*Charadrius melodus*) is a small plover with a short, stout, black bill, yellow to greenish-olive legs, and very pale upperparts. In Florida, this species is usually encountered in winter plumage. The black band across the forehead and a dark ring partly around the neck, present in breeding birds, fades in winter birds and are not present in juveniles. Habitat consists of dry sandy beaches for nesting. Foraging occurs on tidal flats along inlets and creeks. This species is listed as threatened by the FFWCC and threatened with Critical Habitat by the USFWS. Critical Habitat is associated with coastal dune habitat in Bay and Gulf Counties. No critical habitat is associated with the project area (Figures 27 and 28 in Appendix A).

Marian's marsh wren (*Cistothorus palustris mairanae*) is identified by a prominent white stripe above the eye with a plain, unstreaked crown, and a black triangle on its back, which is streaked with white. Marian's marsh wren has a dark cinnamon-brown head, neck, and upper back; dark brown wings, rump, tail, and lower back; and underparts shaded with brown. Habitat includes tidal marshes dominated by smooth cordgrass (*Spartina alterniflora*) on the Atlantic coast and by black needlerush (*Juncus roemerianus*) on the Gulf coast. This species prefers taller vegetation found along tidal creeks. This species is listed as a species of special concern by the FFWCC and is not listed by the USFWS.

Stoddard's yellow-throated warbler (*Dendroica dominica stoddardi*) is a seed-eating, small to moderately large passerine bird with a strong, stubby beak. Characteristics include a yellow throat and chest with gray back, a black face connecting to stripes down sides, a white

eyestripe, white earpatch and two white wingbars. They have a bouncing flight, alternating flapping with gliding on closed wings. Habitat includes tall trees in pine forests, sycamore-bald cypress swamp and riparian woodlands. Nesting and foraging occurs high in the canopy of these swamps and pine forests. They are sometimes found in migration and winter in a variety of woodland, scrub, brush and thicket situations but most frequently in pine woodland if such habitat is available. This species is not listed by the FFWCC and the USFWS encourages consideration during project planning.

Little blue heron (*Egretta caerulea*) is a medium-sized heron, with a purplish to maroon-brown head and neck. There is a small white patch on the throat and the upper neck. The body is slate-blue. The bill is black towards tip, especially during breeding season, with the other exposed areas on the head appearing dark gray to cobalt blue. The legs are grayish to green, becoming black in breeding season. Immature birds are mostly white with pale slate-gray tips on primary wing feathers. Legs of young birds are yellowish green. Immature birds retain yellowish legs during second year. Nesting season for this species occurs late February through August. The little blue heron usually nests in mixed species colonies. The male and female construct a stick nest together within forested or shrub-dominated islands. Breeding colonies are rare in the western panhandle and the Florida Keys. The little blue heron feeds primarily in freshwater when feeding salt-intolerant young a diet of small fish, frogs, lizards, snakes, small turtles, and aquatic invertebrates. The little blue heron is listed by the FFWCC as a species of special concern and is not listed by the USFWS.

Snowy egret (*Egretta thula*) is a medium-sized, all-white wading bird that has a “slight” appearance in comparison to other wading birds. The bill is black with a bright yellow, fleshy base, and the yellow extends back to the lores and eyes. The legs are black in adults with bright yellow feet. Immature birds have greenish legs that sometimes have a yellow streak on the back. Breeding-season adults have prominent plumes on shoulders, neck, and head. This species nests March through August in multi-species colonies located in shrub-covered wetlands or islands in lakes and coastal lagoons. Breeding is documented in 43 counties in Florida but is variable in the western panhandle. The snowy egret feeds on aquatic and terrestrial invertebrates, frogs, small rodents, prawns, crayfish, and worms. The snowy egret is listed by the FFWCC as a species of special concern and is not listed by the USFWS.

Tricolored heron (*Egretta tricolor*) is a medium-sized heron with a slender neck. The body color appears two-toned with dark slate coloration on the head, neck, and body that contrasts with a white rump, belly, and undertail. A reddish-brown and white streak extends along the front of the neck. During breeding season, adults have white head plumes and rufous to whitish shoulders. Young birds have more reddish-brown on head, neck, and mantle but otherwise similar to adults. This species’ nesting season is from late February to August, and nesting typically occurs in mangrove or willow trees in mixed or single species rookeries. Breeding colonies in the panhandle are variable and not as reliable as southern peninsular Florida. The tri-colored heron feeds on small fish, frogs, tadpoles, crustaceans, snails, worms, and aquatic insects. The tri-colored heron is listed by the FFWCC as a species of special concern and is not listed by the USFWS.

Arctic peregrine falcon (*Falco peregrines tundrus*) has long pointed wings, a dark crown and nape, and a dark wedge extending below the eye. The forehead is pale in immature birds, which are mainly brownish above rather than black or gray as in adults. The arctic birds are relatively pale, and peregrines of the northwest coast of North America are very dark, compared to the intermediate coloration of the subspecies that once ranged across North America. The bird averages 41 to 51 cm long and 91 to 112 cm in wingspan. Migrant and wintering peregrine falcons can potentially occur anywhere in Florida. Peregrines rely on a constant and plentiful abundance of birds, their primary food source. This species usually requires open spaces for hunting and taking prey. Common habitats where peregrines have been documented include coastal and barrier island shorelines, river margins, sloughs, marshes, and in urban areas with adequate prey. The peregrine falcon is listed as endangered by the FFWCC and was delisted by the USFWS in 1999; however, the USFWS encourages consideration during project planning.

Southeastern American kestrel (*Falco sparverius paulus*) is the smallest falcon in the U.S. and similar in size to the familiar mourning dove (*Zenaida macroura*). The male has blue-gray wings, while the female is larger and has more uniformly rufous back and wings. Both sexes have a mustached black-and-white facial pattern with strong perpendicular lines extending below the eye and near the ear, and a black band at base of rufous tail. This species nests during mid-March through June, typically in abandoned woodpecker cavities or man-made cavities. The kestrel prefers sparsely canopied habitats and low, open ground cover for foraging. This species feeds mainly on insects and lizards, although it occasionally consumes small rodents and birds. The Southeastern American kestrel is listed by the FFWCC as a threatened species and the USFWS encourages consideration during project planning.

Florida sandhill crane (*Grus Canadensis pratensis*) is a tall, long-necked, long-legged bird with a clump of feathers that droops over the rump. Adult is gray overall, with a whitish chin, cheek, and upper throat, and dull red skin on the crown and lores. Flies with neck extended. Habitat consists of prairies, freshwater marshes, and pasture lands. Avoids forests and deep marshes but uses transition zones and edges between these and prairies or pasture lands. Will frequent agricultural areas like feed lots and crop fields, and also golf courses and other open lawns, especially in winter and early spring. Nest is a mound of herbaceous plant material in shallow water or on the ground in marshy areas. Favors wetlands dominated by pickerelweed and maidencane. This species is listed as threatened by the FFWCC and is not listed by the USFWS.

American oystercatcher (*Haematopus palliatus*) is a large, heavy shorebird with bright red bill and pink legs. The bird is black on the back, head, and chest, and largely white below. The back color grades from black to brown towards the tail. In flight, a conspicuous diagonal white stripe extends along length of each wing and forms a “v-pattern” with white at the base of the tail. Habitat consists of large areas of beach, sandbars, mud flats, and shellfish beds for foraging. They use sparsely vegetated sandy areas or shell-covered beaches for nesting, but will also use beach wrack and marsh grass. This species is common along the Gulf coast of Florida but rare in the panhandle west of St. Vincent Island. This species is listed as a species of special concern by the FFWCC and is not listed by the USFWS.

Bald eagle (*Haliaeetus leucocephalus*) is large raptor (bird of prey) with a wingspread of 5½ to 8 feet. Adults have a dark brown body and wings, white head and tail, and a yellow beak. In flight, the bald eagle often soars or glides with the wings held at a right angle to the body. Juvenile bald eagles have mottled brown and white plumage, gradually acquiring their dark brown body and distinctive white head and tail as they mature. Bald eagles generally attain adult plumage by 5 years of age. Adults weigh 8 to 14 pounds, occasionally reaching 16 pounds in Alaska. Those in the northern range grow larger than those in the south, and females are somewhat larger than males. The bald eagle most commonly occurs in areas close to coastal areas, bays, rivers, lakes, or other bodies of water that provide concentrations of food sources, including fish, waterfowl, and wading birds. Usually the bald eagle nests in tall trees (mostly live pines) that provide clear views of surrounding area. The bald eagle is no longer listed by the USFWS or the FFWCC. This species is, however, protected by the federal government under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Wood stork (*Mycteria americana*) is listed as endangered by the USFWS and the FFWCC. The wood stork is a large colonial wading bird that inhabits inundated forested wetlands and forages in short- and long- hydroperiod wetlands. Wood storks have predominantly white bodies, black and white wings, and short black tails. Their legs are dark feet are beige. Adults have bare, scaly, dark-gray heads and necks and long, heavy, de-curved bills. Wood storks feed primarily on small fish, but will also prey upon frogs, crayfish, crabs, snakes, and rodents. Wood storks form nesting colonies generally from January to March in cypress trees or on mangrove islands. Young fledge in July and August. A core foraging area (CFA) has been established for each colony in north Florida. A CFA comprises a 13-mile radius surrounding the colony boundary and USFWS guidelines protect wetlands of the appropriate hydrologic regime within a CFA. There are no known wood stork colonies or CFAs in or adjacent to the project area.

Brown pelican (*Pelecanus occidentalis*) is a large, heavy waterbird with a massive bill and huge throat pouch. The wings and body are mostly grayish brown. Non-breeding adults have a whitish head and neck, often washed with yellow. In breeding adults, hindneck becomes a dark chestnut color. The head and neck of the immature bird is grayish brown, and the under parts are whitish. The breeding season for this species occurs from early spring through summer. The brown pelican can nest in trees, shrubs, or on the ground near the coast. Sandbars and mudflats are utilized by brown pelicans for roosting and resting areas. This species feeds primarily on fish, but occasionally consumes crustaceans. The brown pelican is listed by the FFWCC as a species of special concern and is not listed by the USFWS.

Red-cockaded woodpecker (RCW) (*Picoides borealis*) is a territorial, non-migratory species that is one of seven woodpeckers inhabiting the southeastern U.S. While longleaf pine is the preferred species for excavation, RCWs also build cavities in loblolly, shortleaf, slash, and pond pine (Baker 1978). In northwestern Florida, trees less than 50 years old were avoided, while trees 50 to 150 years old were used in proportion to their availability, and trees greater than 150 years old were preferred (FWS 2005). The RCW is the only North American woodpecker to excavate roost and nest cavities in living pine trees. The diet of RCWs consists of mainly insects, and smaller amounts of fruits and seeds. RCWs live in

family units called “groups”, which typically comprise a potential breeding pair and two to five offspring. The aggregate of cavity trees used by a group is called a “cluster”. Cavity trees that are being used by RCWs are designated as “active” while those not currently being used are deemed “inactive”. Suitable-preferred RCW habitat is marked by old pines (>80 years old) that serve as potential cavity trees and contiguous foraging habitat dominated by pines typically >30 years old. Suitable habitat is further characterized by a “park-like” structure (mature pine overstory and understory comprising herbs and grasses) maintained and enhanced by frequent fire. RCW clusters are about 10 acres in size while foraging habitat per group generally encompasses between 75 to 300 acres. The RCW is listed as endangered by the USFWS and as a species of special concern by the FFWCC.

Black skimmer (*Rhynchops niger*) is a coastal waterbird with a red, black-tipped bill and red legs. The bills’ lower mandible is much longer than upper, and whole bill is laterally compressed, like a knife. The top of the head, back, and most of the upper sides of the wings are black in adults and mottled dingy brown in juveniles. There is a white trailing edge on the wings, and the outer tail feathers are white. The forehead, cheeks, and under parts are white, contrasting sharply with black above. Non-breeding adults have a white collar. The bird skims food (mostly small fishes) from the surface of the water while flying with its lower mandible in the water. Habitat consists of coastal waters, including beaches, bays, estuaries, sandbars, tidal creeks (foraging), and also inland waters of large lakes, phosphate pits, and flooded agricultural fields. This species nests primarily on sandy beaches, small coastal islands, and dredge spoil islands, but also on gravel rooftops. This species is listed as a species of special concern by the FFWCC and is not listed by the USFWS.

Least tern (*Sterna antillarum*) is the smallest North American tern. Breeding adults are light gray above with a black cap and nape and a white forehead. There is a black line running from crown through eye to base of bill. The bill is yellowish-orange, often with a dark tip (black in non-breeding adults). Under parts are white or grayish. The tail is short and deeply forked. The legs and feet are yellowish-orange. The outer primaries have dark edges conspicuous in flight. The immature bird has a dark bill and black eye-line and is mottled above with more dark on upper wing. Habitat consists of coastal areas throughout Florida, including beaches, lagoons, bays, and estuaries. Increasingly, this species uses artificial nesting sites, including gravel rooftops, dredge spoil islands or other dredged material deposits, construction sites, causeways, and mining lands. Nesting areas have a substrate of well-drained sand or gravel and usually have little vegetation. This species is listed as threatened by the FFWCC and is not listed in the State of Florida by the USFWS.

5.1.5 Mammals

Choctawatchee beach mouse (*Peromyscus polionotus allophrys*) is a small mouse (adults generally 5 - 5.5 inches long) with a short tail (2 inches). Dorsal fur is buff-brown or orange-brown. Flanks, feet, and underside are white. Dorsal and head patterns are variable but are generally as follows: color either extends down the thighs or is squared; mid-dorsal fur is generally darker, forming a broad band down the length of the back; dorsal color may extend to the tip of the nose or end just behind the eyes. Tail may have a dark dorsal stripe, but often is all white. Habitat is restricted to primary, secondary, and occasionally tertiary sand dunes with a moderate cover of grasses and forbs, including sea oats (*Uniola paniculata*), bitter

panicum (*Panicum amarum*), Gulf bluestem (*Schizichyrium maritimum*), beach dropseed (*Sporobolus virginicus*), and telegraph weed (*Heterotheca subaxillaris*). High, stable areas supporting sand live oak (*Quercus geminata*) may be important following hurricanes that remove substantial dune habitat. Distribution has historically occurred from Moreno Point, Okaloosa County, to the entrance of St. Andrews Bay. This species is only known to occur on Topsail Hill, Shell Island, and Grayton Beach. The Choctawhatchee beach mouse is listed as endangered by the FFWCC and endangered with Critical Habitat by the USFWS (Figures 27-29 in Appendix A). Critical Habitat is associated with coastal dune habitat in Bay and Gulf Counties. No Critical Habitat is associated with the Alternative Alignments.

St. Andrews' beach mouse (*Peromyscus polionotus peninsularis*) is a small mouse (adults generally 5 - 5.5 inches long) with a short tail (2 inches). Dorsal fur is pale buff. Flanks, feet, and underside are white. Dorsal color may either taper down the thighs or end abruptly; color may extend to the tip of the nose or end just behind the eyes; tail may have a dorsal stripe, but is usually all white. Habitat is restricted to primary, secondary, and occasionally tertiary sand dunes with a moderate cover of grasses and forbs, including sea oats, bitter panicum, Gulf bluestem, beach dropseed, and telegraph weed. High, stable areas supporting sand live oak may be important following hurricanes that remove substantial dune habitat. Distribution has historically occurred from the eastern entrance of St. Andrews' Bay, Bay County, to St. Joseph Peninsula, Gulf County. This species is known to occur only from the north end of St. Joseph Peninsula and eastern Bay County. The St. Andrews' beach mouse is listed as endangered by the FFWCC and endangered (with Critical Habitat) by the USFWS (Figures 27-29 in Appendix A). Critical Habitat is associated with coastal dune habitat in Bay and Gulf Counties. No Critical Habitat is associated with the Alternative Alignments.

Southeastern big-eared bat (*Plecotus rafinesquii*) is a medium-sized (3.6 - 4.1 inches) bat with very long ears that extend to the center of the back when laid down and two large, glandular lumps on nose. Fur is long, silky, and bicolored. Habitat consists of forested communities, particularly those associated with floodplains, supporting large, hollow trees used for roosting; also pine flatwoods and mixed oak-pine forests. Often roosts in old buildings and culverts. This species occurs throughout Florida south to Collier County, but few occurrences. This species is listed as a species of consideration encouraged by the FFWCC and is not listed by the USFWS.

West Indian manatee (*Trichechus manatus latirostris*) is a large (182 to 400 lbs.), gray, nearly hairless, walrus-like aquatic mammal. The tail is broad, rounded, and flattened. The front limbs are flipper-like, with three nails. The hind limbs are absent. The head is broad and undifferentiated from the body. The upper lip is deeply cleft and bears stiff bristles. The manatee is an opportunistic feeder, consuming over 60 species of plants, including submerged, emergent, and floating vegetation. This species migrates to sources of warmer water during the winter months. The manatee is listed as endangered by the FFWCC and the USFWS.

Florida black bear (*Ursus americanus floridanus*) is The Florida black bear is a large mammal (3 to 3.5 feet tall at the shoulder; 180-250 pounds) with glossy black hair and a brown muzzle. In males, front feet range from 3.5 to 5.5 inches by 3.3 to 5.9 inches, and the

rear feet measure 3 inches by 5.5 to 8.7 inches. The historical range included nearly all of Florida. Currently, the black bear occurs discontinuously across Florida with substantial populations in the Apalachicola River to the Big Bend Area, Baker and Columbia Counties, Ocala National Forest region, and Collier to Highlands Counties. Black bears prefer forested areas with dense understory vegetation such as “thick and impenetrable” swamps. Access to a variety of habitats that provides an assortment of food during different seasons of the year is also important. Florida's temperate-subtropical climate, long growing season, numerous swamps, and diverse vegetation types provide excellent conditions for this species. Black bears feed on almost any succulent, nutritious vegetation (tubers, bulbs, berries, nuts, and young shoots) and colonial insects. The fruits of saw palmetto, cabbage palm, swamp tupelo, and oaks are preferred plant foods in fall. The honey bee is the most frequently eaten insect and armadillos are the most commonly eaten vertebrate. Bears are most active at night (nocturnal). They also tend to reduce their movements during the coldest months of the year. Signs of bear activity may include shredded cabbage palm, shredded logs, and large scratches on trees. Bear scat is similar to that of dogs, but may vary in consistency and may contain a mix of seeds, hairs, and grasses. The Florida black bear not listed by the USFWS and is listed as threatened by the FFWCC.

5.1.6 Invertebrates

Southern elktoe (*Alasmidonta triangulata*) is a freshwater mussel that has a moderately thin, inflated shell, often with distinct concentric sculpturing originating at the umbo and rarely exceeding 2 inches long. Umbos are elevated above the hingeline and positioned to the anterior portion of the subtriangular shell. The anterior margin of the shell is rounded while the posterior margin is bluntly pointed. The posterior ridge is sharp and angular. Adults typically have dark brown to black periostracum with faint rays while young individuals have yellow to green with green rays present. This species typically occupies large creeks to large rivers with soft substrates of silt, mud, sand, or gravel, often in backwaters and pools. The southern elktoe may be restricted to the Flint and Chattahoochee (Apalachicola) Rivers. The southern elktoe is not listed by the FFWCC and the USFWS encourages consideration during project planning.

Fat threeridge (*Amblema neislerii*) is a medium-large bivalve mollusk reaching a length of 4 inches. Valves (shell) are dark brown to black, strongly sculptured with seven to nine prominent, horizontal, parallel ridges, somewhat square in outline, inflated (deep; highly so in older specimens), solid, and heavy; umbos are found toward the anterior end of shell. Internally, they are nearly equal-sized with teeth below the umbo of the left valve, and usually one large and one small tooth in the right valve; nacre is (inner lining of valves) bluish white to light purplish, very iridescent. The incised groove-bur is usually found in upland fire-maintained longleaf pine-oak communities, on bluffs, open pine woods, small clearings, or old roads in sandy or sandy loam soils but will occasionally tolerate mesic environments. Habitat includes main channel of small to large rivers in slow to moderate current; substrates include sand, sandy mud, gravel, and rocky rubble. Fat threeridge occurs in the Apalachicola and lower Chipola Rivers of the Florida panhandle. This species is listed as endangered by the USFWS and FFWCC encourages consideration during project planning (Figures 27-29 in Appendix A).

Apalachicola floater (*Anodonta heardi*) is a medium-large bivalve mollusk reaching a length of 4.4 inches. Valves are yellowish olive to light brown, sometimes with dark olive to brown concentric bands; smooth, except slightly roughened posteriorly; and oval and very inflated (deep). Umbos are near the middle of the shell, and in large individuals extending above hinge line and bearing simple, sculptured loops. Valves lack internal teeth; nacre is white with some pinkish to purplish color. Habitat includes river floodplain waters with little or no current, such as floodplain lakes and backwaters with muddy substrates. Florida distribution is exclusive to the mainstem of Apalachicola River. The Apalachicola floater is not listed by the FFWCC and the USFWS encourages consideration during project planning.

Rayed creekshell (*Anodontoides radiates*) is a small freshwater mussel that usually reaches 3.0 inches in length. It has a smooth, thin shell that is nearly oval in shape. The periostracum (outer shell surface) is brownish to olive brown and adorned with prominent dark green rays. The nacre is bluish white and sometimes marked with light yellow spots. Adult mussels are typically sessile and are found attached or buried in the sand, mud or gravel bottoms of creeks and rivers with slow to moderate currents. Adult mussels are filter feeders and usually feed upon plankton and detritus from their aquatic environment. The rayed creekshell is usually only found in small numbers, especially in the Apalachicola-Chattahoochee-Flint River system. The rayed creekshell is not listed by the FFWCC and the USFWS encourages consideration during project planning.

Chipola slabshell (*Elliptio chipolaensis*) is a medium-sized bivalve mollusk reaching a length of 3.3 inches. Valves are chestnut colored, usually with one to four dark, concentric bands and dark umbos (smooth, oval to nearly elliptical, somewhat inflated (deep) though with slightly concave posterior slope. Umbos are prominent, extending well above hinge line. Posterior ridge extends from umbo to posterior end starts out rounded but flattens to form two angles along shell margin. Internally, cavity of umbo is relatively deep; nacre (inner lining of valves) salmoncolored, more intense near hinge, somewhat iridescent. Chipola slabshell habitat is typically the main channel of river and lower reaches of larger tributaries. The only Chipola slabshell population is restricted to the Chipola River system above Dead Lakes in Gulf County. The Chipola slabshell is not listed by the FFWCC and is listed as threatened with Critical Habitat by the USFWS. No critical habitat is associated with the project area (Figures 27-29 in Appendix A).

Purple bankclimber (*Elliptiodeus sloatianus*) is a very large bivalve mollusk reaching a length of 8 inches. Valves are brownish black to black, heavy and strongly sculptured, nearly rhomboidal in shape, and moderately inflated (deep). A well-developed posterior ridge extends from umbos (raised areas on valves near hinge) to posterior ventral edge of shell; along and near this are several irregular ridges. Umbos are low, barely extending above its hinge. Internally, two teeth are found below umbo of left valve, and one in right valve; nacre is whitish near center to deep purple toward margin, very iridescent posteriorly. Habitat is typically small to large rivers with slow to moderate current, and substrate of sand, sometimes mixed with mud or gravel. Distribution is restricted to the Apalachicola and Ochlockonee Rivers; the former Chipola River population appears to have been extirpated. The purple bankclimber is not listed by the FFWCC and listed as threatened with Critical

Habitat by the USFWS. No Critical Habitat is associated with the project area (Figures 27-29 in Appendix A).

Shinyrayed pocketbook (*Hamiota subangulata*) is a medium-sized bivalve mollusk reaching a length of 3.3 inches. Valves are a shiny, light yellowish brown with medium-wide emerald green rays (darker brown with rays obscured in some older individuals) over entire surface; smooth, roughly elliptical, and solid but fairly thin. Umbos are broad and somewhat inflated (deep or broad); the posterior ridge extends from umbo to posterior margin and is rounded, not angular. Internally, two large, erect teeth are below umbo of left valve, and one large and one flatter tooth is found in the right valve; nacre is white, sometimes with salmon tint in cavity of umbo. Habitat is typically medium-sized creeks and rivers with slow to moderate current and clean or silty sand substrates. Distribution is restricted to the Chipola and Ochlockonee Rivers, with one historic site in a tributary of upper Apalachicola River; not confirmed in Liberty County. The shinyrayed pocketbook is not listed by the FFWCC and listed as endangered with Critical Habitat by the USFWS. No Critical Habitat is associated with the project area (Figures 27-29 in Appendix A).

Gulf moccasinshell (*Medionidus penicillatus*) is a small bivalve mollusk reaching a length of 2.2 inches. Valves are yellowish to greenish brown with fine, often broken, green rays; mostly smooth, elongated elliptical to rhomboidal in shape, somewhat inflated (deep), with relatively thin valves with nearly straight to slightly rounded ventral margins. A rounded to slightly angled ridge runs from umbo to end of shell; behind this is a series of low, thin, radiating ridges. Internally, two stubby teeth are below umbo of left valve and one tooth in right valve; nacre is smokey purple or greenish, slightly iridescent posteriorly. Habitat is typically medium-sized creeks to large rivers with sand, muddy sand, and gravel substrates and slow to moderate currents; they are occasionally found in backwater areas with no current. Distribution is restricted to the Chipola River and Econfinia Creek (Bay County); formerly but possibly no longer in Choctawhatchee, Yellow, and Apalachicola rivers. The Gulf moccasinshell is not listed by the FFWCC and listed as endangered with Critical Habitat by the USFWS. No Critical Habitat is associated with the project area (Figures 27-29 in Appendix A).

Oval pigtoe (*Pleurobema pyriforme*) is a small bivalve mollusk reaching a length of 2.4 inches. Valves are a plain but shiny yellowish to chestnut in color (with faint green rays in some small specimens), oval and compressed (relatively flattened) to somewhat inflated (deep), with a smooth surface marked by distinct concentric growth lines; a prominent ridge reaches from umbo to posterior end, which tapers slightly to a blunt point. Umbos extend slightly above hinge line. Internally, two fairly large teeth are below umbo of each valve; nacre is salmon to bluish white and iridescent posteriorly. Habitat is typically medium-sized creeks to small rivers, usually with slow to moderate current and clean substrates of silty sand to sand-gravel mix. Distribution is restricted to the Chipola, Ochlockonee, and Suwannee (especially Santa Fe and New Rivers) River systems and Econfinia Creek (Bay County). The oval pigtoe is not listed by the FFWCC and listed as endangered with Critical Habitat by the USFWS. No Critical Habitat is associated with the project area (Figures 27-29 in Appendix A).

Sculptured pigtoe (*Quadrula infucata*) is a small freshwater mussel that often measures between 1.2 and 2.2 inches in length. It has a heavy shell that is nearly circular in shape. The periostracum (outer shell surface) is quite variable in appearance. Shells may be dull brown, greenish brown or dark black in color. Most of the surface is usually decorated with distinctive "V"-like ridges. The nacre is bluish white. This species appears to prefer a habitat of moderate to swiftly flowing water and is sometimes found at the bottom of deeper portions of rivers and creeks. This species is native to the Apalachicola region of Georgia, Florida and Alabama. This region includes the Chipola River and Apalachicola-Chattahoochee-Flint River system. The sculptured pigtoe is not listed by the FFWCC and the USFWS encourages consideration during project planning.

Downy rainbow (*Villosa villosa*) is a small freshwater mussel that usually measures less than 2.5 inches long. It has a fairly thin shell that is moderately inflated or swollen and oval-shaped. The umbos are moderately swollen and often decorated with several fine ridges. The periostracum is generally rough and greenish yellow, dark green or brownish black. The shell surface is also decorated with faint blue, green or yellow rays that are usually not visible to the naked eye. The nacre is bluish-white. Adult mussels are typically sessile and are found attached or buried in the mud, sand or silt bottoms of creeks and rivers. This species appears to prefer a habitat of slow to moderate flowing water and has been found in a number of reservoirs. Brim-Box and Williams (2000) have recently found the Downy Rainbow in the mainstreams and tributaries of the Chipola and Flint Rivers, the mainstream of the Apalachicola River, and 2 tributaries of the Chattahoochee River. They also reported the downy rainbow was located at sites above and below the Fall Line. The Downy Rainbow is not listed by the FFWCC and the USFWS encourages consideration during project planning.

Panama City crayfish (*Procambrus econfinae*) is a small crayfish (about 2 inches long) with a distinctive brown stripe down middle of back, and spots on sides. Specific identification is based on adult male reproductive structures and other body structures and ornamentation. The rostrum (forward projection of shell in front of eyes) is broadly lanceolate and lacks lateral spines, and the areola (rear portion of carapace) is broad and short. In reproductive (form I) males, the palm of the chela (claw) is naked, not bearded, along its inner margin. Females are known to reproduce in late spring and early summer. The PCC is generally found in wet flatwoods but, PCC specimens have been found in roadside ditches, swales, and powerline right-of-way (FFWCC, 2003). Common characteristics of these sites include little or no overstory vegetation, abundant grass or herbaceous groundcover, and seasonal inundation. The PCC is a secondary burrower, meaning it generally occupies burrows but will move into openwater when it is available during rainy seasons (FWC, 2003). The burrows constructed are downward passages from one to three feet long, depending on the depth of the water table. Burrow entrances are marked with crude chimneys made of excavated soil (FWC, 2003). Core soils include the Pamlico-Dorovan complex, Rutledge sand, Plummer sand, Pelham sand, Pantego sandy loam, and Rutledge-Pamlico complex. Secondary soils include Albany sand, Lee field sand, Leon fine sand, Osier fine sand, and Alapaha loamy sand (FFWCC 2007). The species only occurs in Bay County in and around Panama City and is restricted to 26 known sites, none of which occur on public conservation lands. The PCC is listed as a species of special concern by the FFWCC and the USFWS encourages consideration during project planning.

5.1.7 Plants

White Indian plantain (*Arnoglossum album*) is an herbaceous plant 80-100+ cm tall with stems strongly ridged. Basal leaf blades are broadly ovate to narrowly oblong-lanceolate, 15–37 cm, margins usually entire, rarely sinuate or serrulate-denticulate. Cauline leaves are proximal petiolate with blades ovate (12–18+ cm, bases cuneate), margins serrate (apices acuminate); distal sessile, smaller. Corollas are white, rarely tinged with pink, 9–10.5 mm. The white Indian plantain usually flowers from May–mid July. Habitat includes moist loamy sand of small somewhat disturbed savanna (some tree stumps + shrub encroachment) and poorly drained, acidic loamy sands, found in savannas and open pinewoods. White Indian plantain is known only from Bay and Gulf Counties. This species is listed by the Florida Department of Agriculture and Consumer Services (FDACS) as endangered and the USFWS encourages consideration during project planning.

Southern milkweed (*Asclepias viridula*) is a perennial herb that originates from a thickened rootstock. Stems are erect, slender, purplish at base, smooth except for a line of small hairs between leaf nodes. Leaves are 2 - 4 inches long, smooth, opposite, very narrow, slightly widened near tip, 10 - 20 pairs per stem. Flowers (6 – 10) are in flat-topped clusters on stalks in the angle between upper leaves and stem; pale green with maroon tint; petals curved sharply downward; corona consists of incurving horns and erect, unlobed hoods that cover the stigma. Fruit an elongated pod, erect, smooth, up to 4 inches long. All parts of the plant contain a milky sap. Flowers April–July following fire, otherwise very difficult to see. Southern milkweed occurs in wet flatwoods and prairies, seepage slopes, and pitcher plant bogs and is endemic to the Florida panhandle and northeast Florida, but is now mainly found in the Apalachicola National Forest (ANF), where about 30 populations are protected. This species is listed by the FDACS as threatened and the USFWS encourages consideration during project planning.

Apalachicola wild indigo (*Baptisia megacarpa*) is generally described as a rather large-growing perennial forb/herb with terminal spikes of cream or yellow flowers followed by large pods. The leaves are 3-folioate, petals ebracteolate, corolla over 14 mm long. The keel petal on the flowers is not strongly incurved; fruits are thinly coriaceous, 3-4 cm long. Apalachicola wild indigo occurs in floodplain forests, hardwood hammocks, upland mixed forest, and slope forest and is endemic to Florida panhandle but now mainly found in the ANF. This species is listed by the FDACS as endangered and the USFWS encourages consideration during project planning.

Apalachicola dolls daisy (*Boltonia apalachicolensis*) is a perennial herb often with stolons or rhizomes with hairless branched leafy stems to about 1 or 2 m tall. Leaves are alternate, linear to elliptic or oblanceolate, and edges are smooth or with a few teeth. Ray flowers are numerous with slender white to pale pink or blue corollas; disk flowers are also numerous, yellow or greenish. Habitat is exclusively shady floodplain forests found in the Lower Apalachicola River area, Liberty, Calhoun, Gulf, Franklin, and Washington County. This species is listed by the FDACS as threatened and the USFWS encourages consideration during project planning.

Buckthorn (Georgia bully) (*Bumelia thornei*) is a sparsely to bushy-branched and thorny shrub ranging from about 1.5 to 6 m tall. Leaves are alternate, simple, entire, varying from oblanceolate to narrowly elliptic to nearly rounded, upper surface without hairs. Georgia bully occurs in creek hammocks, drainages, and other wet typically where water stands during part of the year. This plant's main distribution is in Georgia and is rarely found in Florida (only two known locations in Jackson County). This species is listed by the FDACS as endangered and the USFWS encourages consideration during project planning.

Buckthorn (*Bumelia lycoides*) is a tardily deciduous tree, ordinarily about 30 feet tall but potentially reaching heights of 65 feet. Branches are thorny and crooked to a slight zigzag. Bark is scaly, grayish brown to reddish brown; leaves alternate, simple, leaf blade oblong-elliptic to elliptic, upper surfaces bright green and glabrous. Buckthorn occurs in hammocks and floodplain forests, predominantly on natural silt levees along rivers, especially along the eastern floodplain of the Apalachicola River and silty areas along the river's western side just south of U.S. 90 and the Jim Woodruff Dam. This species is listed by the FDACS as endangered and the USFWS encourages consideration during project planning.

Curtiss' sandgrass (*Calamovilfa curtissii*) is a clump-forming grass with long, bluish green blades which are 2 to 3 mm wide and up to a meter long. It has culms tufted from a short, thick horizontal rhizome. The lower sheath is firm, overlapping, and persistent. It is similar in appearance to *Sporobolus floridana*. This species occurs in pine savannahs and flatwoods in a few widely separated places. This species is listed as threatened by the FDACS and the USFWS encourages consideration during project planning.

Sweet-shrub (*Calycanthus floridus*) is a deciduous, aromatic shrub that is 1 to 3 meters tall. Leaves are opposite, entire, lanceolate to ovate-lanceolate and are 5 to 18 cm long and 2 to 8 cm wide. The flowers are actinomorphic with fleshy, maroon linear or lanceolate segments. The fruit is an indehiscent pseudocarp which is 8 cm or more long and 5 cm wide, bearing many achenes (seeds). Habitat for this species consists of deciduous forests, clearings, and stream banks. The sweet-shrub is listed as endangered by the FDACS and is not listed by the USFWS.

Baltzell's sedge (*Carex baltzellii*) is a perennial, forming tufts from spreading-ascending, scaly, fibrous rhizomes. The leaves and shoots are numerous per tuft with the longest to 6 dm long and 0.5 to 1.0 cm broad. The leaves and shoots are pale green. Inflorescence spikes are 3 to 5 cm long on erect or ascending stalks. The flowers are unisexual and often grouped into separate male and female spikes. Habitat consists of moist, well-drained, steep ravines of beech, magnolia, longleaf pine, and turkey oak forests. Baltzell's sedge is listed as threatened by the FDACS and the USFWS encourages consideration during project planning.

Cruise's goldenaster (*Chrysopsis gossypina* ssp. *Cruiseana*) is a perennial herb with basal rosettes and several sprawling, flowering stems to 1.5 feet long. These flowering stems spread out and curve upwards as the plants age. The rosette leaves are white-wooly with narrowed, purple bases and are up to 2.4 inches long. The green stem leaves are shorter than the basal leaves and are nearly hairless with glandular dots. The flower heads are approximately 1 inch across and both ray and disk flowers are yellow. Habitat for this

species consists of stable coastal dunes. Cruise's goldenaster flowers from mid-October through mid-November. This species is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

Rosebud orchid or spreading pagonia (*Cleistes divaricata*) is an understated wildflower member of the orchid family 1 to 2 feet in height with one tapering leaf at the base and one at the top of the stem just below the flower stalk. The rosebud orchid has distinct flowers which are pink, large, with a long, tubular corolla. The upper lip of the corolla is bifid and bent backward. The lower lip is marked with red and ragged. The upper three "petals" (actually sepals) are elongate, narrow, and curled. Flowers are solitary at the top of the plant. Stem with narrow, grass-like leaves both upward and downward. The rosebud orchid flowers from June through July. Rosebud orchid is found mostly in wet flatwoods and bogs. In Florida, the species is known from the northern counties south to Lake County. The rosebud orchid is listed as threatened by the FDACS and is not listed by the USFWS.

Alternate-leaf or pagoda dogwood (*Cornus alterniflora*) is a small understory tree native to much of the eastern United States. It gets its common name from its pagoda-like horizontal branching pattern. This small deciduous tree grows to 25 feet (rarely 30 feet) tall, with a trunk up to 6 inches diameter, and the branches develop in characteristic flat layers separated by gaps. Its leaves are elliptic to ovate and grow to 2 to 5 inches long and 1 to 2 inches broad, arranged alternately on the stems, not in opposite pairs typical of the majority of *Cornus* species, the leaves are most often arranged in crowded clusters around the ends of the twigs and appear almost whorled. The topside of the leaves are smooth and green, while the undersides are hairy and a bluish color. Its bark is colored gray to brown and becomes ridged as it ages. Habitat includes bluff forests and creek swamps and is exclusive to Leon, Gadsden, Calhoun, and Walton Counties. The pagoda dogwood is listed as endangered by the FDACS and is not listed by the USFWS.

Tropical waxweed (*Cuphea aspera*) is a perennial herb with erect stems 8 to 16 inches tall. Leaves are entire, oval to lance-shaped, rough-hairy, without leaf stalks; lower leaves are whorled, upper leaves opposite. Flowers are opposite or whorled at upper nodes, with 6 pink-purple, unequal petals. Sepals form a purple, ribbed floral tube with a pouched base. The common name is derived from the waxy or sticky feel of the upper stems, flower stalks, and floral tubes, which are covered with purple glandular hairs scattered among white glandless hairs. Tropical waxweed occurs in seepage areas of bogs, hydric pine flatwoods, open prairies, clearings and rights-of-way in flatwoods. It is endemic to northwest Florida, found only in Franklin, Gulf, and Calhoun Counties. This species is not listed by the FDACS and the USFWS encourages consideration during project planning.

Dew-thread (*Drosera filiformis*) has narrowly filiform leaves to 25 cm long, with purple glandular hairs that dry to dark brown, glabrous flower stalks 6 to 22 cm tall bearing 4-6 purple flowers, and black seeds. This sundew species usually occurs in exposed lake bottoms in Bay and Washington Counties. The dew-thread is listed as endangered by the FDACS and is not listed by the USFWS.

Spoon-leaved sundew (*Drosera intermedia*) is an insectivorous herb with sticky, hairy leaves that glisten in the sunlight. Leaves are arranged in a basal rosette or up on a stem to 10 cm long with leaf blades much shorter than the petiole. The flower stalks are glabrous, 9 to 20 cm tall, with up to 20 white (or pinkish) flowers. Habitat includes bogs, hydric pine savannahs, wet ditches, and hydric pine flatwoods. The spoon-leaved sundew is listed as threatened by the FDACS and is not listed by the USFWS.

Dark-headed hatpin (*Eriocaulon nigrobacteatum*) is a perennial herb, forming rosettes of small, pointed leaves, usually in clumps of several rosettes. Leaves up to 1.5 inches long, very narrow, all basal, radiating outward from the center of the plant, dark green above, whitish below. The flowering stem is 2 - 7.5 inches long, delicate, strongly twisted, and 4-angled. Flower heads are white above by many white hairs on the flower parts, and dark below from gray or black bracts. Habitat includes open, wet, mucky bogs at stream heads or on open, grassy seepage slopes. This species flowers in March, and flowers go to seed in April and May; flower heads and stems then disappear. The dark-headed hatpin is endemic to Bay, Calhoun, and Gulf counties in Florida. The dark-headed hatpin is not listed by the FDACS and the USFWS encourages consideration during project planning. This species was also identified as being proximal to alternative alignments in the FNAI-TNC Report (2001).

Telephus spurge (*Euphorbia telephoides*) is a perennial herb with numerous, erect stems to 1 foot tall. Stems and leaves smooth and fleshy with milky sap. Leaves 1 to 2 inches long, alternate, without leaf stalks, widest above the middle, usually with maroon midribs and margins. Flowers found in reddish-green cyathia (cup-like structures) with 1 female flower (an ovary less than 0.5 inch long) and several male flowers (one stamen each) on short stalks, surrounded by 4 to 5 minute, petallike glands. Habitat consists of longleaf pine savannas, scrubby and mesic flatwoods, and coastal scrub on low sand ridges near the Gulf of Mexico. It is endemic to Bay, Franklin, and Gulf counties. Telephus spurge is listed as endangered by the FDACS and is listed as threatened by the USFWS.

Pine-woods aster (*Eurybia spinulosus*/*Aster spinulosus*) is a perennial herb with stems usually solitary, 12 to 28 inches tall. Basal leaves are approximately 8 inches long, tufted, grass-like; only the midveins are visible; old, fibrous leaf bases persistent. Stem leaves are stiff, short, and bract-like. A whorl of spiny, erect bracts (involucre) encloses the base of the flower head; bracts are loose but are not spreading or curved downwards. Ray flowers (8 to 15) are white to pink or purple. Habitat consists of mesic to wet pine flatwoods, seepage slopes, or savannas with wiregrass, gallberry, and saw palmetto. This species flowers May through October, usually mid-summer. Pine-woods aster is listed as endangered by the FDACS and the USFWS encourages consideration during project planning. This species was also identified as being proximal to Alternative Alignments in the FNAI-TNC Report (2001).

Wiregrass gentian (*Gentiana pennelliana*) is a perennial herb with solitary flowers (not involucre), white corolla, spotted with blue-green on the inner surface. Habitat is exclusive to flatwoods. This species flowers in the winter through spring and is in fruit (most recognizable) from October through November. Wiregrass gentian is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

Harper's beauty (*Harperocallis flava*) is a perennial herb with leaves 2.5 to 8 inches long, all leaves are basal, narrow, ribbed, and pointed, flat or slightly twisted, overlapping at base of stem (like iris leaves); old leaf bases are persistent. Flower stalk is approximately 2 feet tall, leafless, except for 3 to 5 tiny bracts; 1 flower present per stalk. Flower contains 6 yellow, spreading tepals (3 petals + 3 sepals), 6 stamens, and ovary with 3 to 6 lobes. Fruit surrounded by erect, leathery tepals, which have darkened to yellow-green with red tips. Habitat includes wet prairies, seepage slopes, pitcherplant bogs, especially in transitions to shrub zones, and in nearby roadside ditches. This species flowers in May. Harper's beauty is listed as endangered by the FDACS and listed as endangered by the USFWS.

Henry's (panhandle) spiderlily (*Hymenocallis henryae*) is a perennial herb with 4 to 8 leaves 14 to 26 inches long, strap-shaped and tapering to a blunt tip, often waxy, deciduous rising from a bulb. Flower stalk usually 18 - 30 inches tall, rounded, stout, topped with 1 to 2 showy, fragrant flowers. Flower consists of a tube, 4 inches long; 6 narrow, pale green segments, 4 to 6 inches long and radiating outward; and corona, 2 inches across, white, broadly funnel-shaped and toothed, with 6 attached stamens. Fruit is nearly an inch broad, oblong, green. Habitat consists of wet flatwoods, edges of cypress stringers and ponds. This species flowers mid-May to mid-June, and may be recognized by fruits and leaves through mid-July. Henry's spiderlily is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

Smooth-barked St. John's wort (*Hypericum lissophloeus*) is a shrub that grows to 13 feet tall, with a single trunk, bushy crown, and prop roots at base. Its bark is thin, smooth, shiny, chestnut-brown, becoming silvery-metallic and peeling off in thin, curling sheets. Leaves are 0.5 to 0.75 inch long, needle-like, waxy, grayish green, and gland-pitted along inrolled margins; most leaves in clusters on spur shoots, some opposite. Flowers are usually solitary, with many stamens and 5 yellow petals, each petal with a small tooth on the margin. Fruit are 0.3 inch long, erect, pointed, three-lobed. Habitat includes shores and shallow water of sandhill upland lakes and karst ponds. This species flowers May to first frost. Smooth-barked St. John's wort is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

Thick-leaved water willow (*Justicia crassifolia*) is a small perennial herb with erect, square, hairy stems with few branches. Characteristics include distinct fleshy leaves and large, purple flowers 0.5 to 1.2 inches long. The leaves are mostly sessile, 5 to 10 cm long; corolla reddish-purple with raised herringbone pattern outlined in white on the lower lip. Habitat is exclusive to wiregrass savannahs and adjacent ditches. This species flowers in the spring through summer and is found only in Gulf and Franklin Counties. Thick-leaved water willow is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

Mountain laurel (*Kalmia latifolia*) is a large shrub or small tree with thick, leathery evergreen leaves. The leaves are alternate, elliptic to elliptic-oblongate in shape, and 5 to 12 cm long and 1.5 to 5 cm wide. The inflorescence for *Kalmia* spp. is distinct and sepals are glabrous. The corolla is white or pink, usually with a purple spot around each pocket, and the top of the corolla has triangular lobes. Habitat consists of sandy (or rocky) woods that are

moist but well-drained. The plant will tolerate drier soil conditions. This species flowers from April through June. The mountain laurel is listed as threatened by the FDACS and is not listed by the USFWS.

Southern red lily (*Lilium catesbaei*) is a bulbous perennial herb with an erect, leafy stem, approximately 50 – 70 cm tall. The flower is solitary, erect, and showy with an orange to red-orange, spotted perianth that narrows and becomes whitish to yellowish-green toward the base. This species occurs in bogs, wet wiregrass prairies, and mesic pine flatwoods. The southern red lily flowers in the summer through the fall. The southern red lily is listed as threatened by the FDACS and is not listed by the USFWS.

Harper's grooved flax (*Linum sulcatum* var. *harperi*) is an annual herb 4 to 24 inches tall with smooth, narrowly wing-angled stems. Leaves are 0.4 to 1.2 inches long, very narrow, alternate. Flowers are about 0.5 inch wide, with 5 yellow-orange petals and 5 gland-toothed sepals; style undivided for almost entire length. This species occurs in dry or mesic pinelands and flatwoods. Harper's grooved flax is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

West's flax (*Linum westii*) is perennial herb with several smooth, narrowly wing-angled stems 8 to 20 inches tall. Leaves about 0.5 inch long, decreasing in size upward along the stem, very narrow, erect; leaves on lower half of stem opposite with rounded tips, leaves on upper half of stem alternate with pointed tips. Flowers open in late afternoon at tips of a few branches at the top of the plant, with 5 pale yellow, spreading petals, 5 fringed sepals bearing stalked glands, 5 stamens, and 5 styles. Fruit is a small, round capsule, with persistent sepals and a tiny, pointed beak. West's flax flowers from May–July. This species occurs in wet flatwoods, depression ponds, and cypress pond margins. West's flax is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

Gulf Coast lupine (*Lupinus westianus*) is a biennial or perennial herb with a soft-woody base and shrubby appearance. The stems are silvery and upright or spreading, and the leaves are simple with lower ones clustered and upper ones alternate. The flowers are blue, pea-like in erect clusters. This species flowers from March until May and is found within sandhills, scrubs and coastal dunes. This species is listed as threatened by the FDACS and is not listed by the USFWS.

Curtiss' loosetrife (*Lythrum curtissii*) is a slender herb rising from a woody base, with one to several erect, multi-branched stems whose upper branches are four-sided or slightly winged. Leaves are small and widely-spaced with very short or no leafstalks; leaves on upper branches are usually alternate, those on lower stems opposite and larger, up to 1.6 inches long, usually shed by flowering time. Flowers present in angles of upper leaves, slightly asymmetrical, with 6 bright rose-purple petals emerging from a green and purple-ribbed tube formed by 6 tiny, pointed sepals; the sepals are alternate with 6 tiny appendages that are the same size as the sepals. Fruits are small, cylindrical and reddish-brown in color. This species flowers from June through early September and is found in wet roadside ditches and clearings in wet flatwoods; sunny patches in stream thickets and floodplain forests. This

species is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

White birds-in-a-nest (*Macbridea alba*) is a perennial herb, 1 to 1.5 feet tall, with erect, square stems. Leaves are 2 to 4 inches long, opposite in 6 to 8 pairs, thick and usually rough-hairy, widest above the middle with rounded tips, and dotted with glands; leaf margins have low, widely spaced teeth tipped with glands; leaf stalks with narrow wings. Flowers are held erect in short, leafy heads usually at the ends of branches; flowers are showy, over 1 inch long, snowy white with 4 stamens with cottony hairs. The upper lip is hood-like, lower lip 3-lobed. This species flowers from May to mid-July and is found in wet to mesic pine flatwoods and associated roadsides. This species is listed as endangered by the FDACS and is listed as threatened by the USFWS.

Hummingbird flower (*Macranthera flammea*) is a large, coarse, biennial herb with erect, square stems. The plant is 5 to 10 feet tall with leaves 3 to 4 inches in length. The leaves are opposite, deeply lobed, and toothed. Flower clusters are up to 2 feet long with bright orange flowers. The flowers are fleshy with a tube up to 1 inch long and 5 short lobes. Habitat includes seepage slopes, wet stream side thickets, edges of baygalls, and cypress and gum ponds. This species is listed as endangered by the FDACS and is not listed by the USFWS.

Ashe's magnolia (*Magnolia ashei*) is a small tree or large shrub, 15 to 30 feet tall, usually with several leaning, gray-barked trunks. Twigs are stout with conspicuous stipule scars encircling the stem and large, shield-shaped leaf scars. Leaves are 1 to 2 feet long (largest simple leaves of any Florida tree), alternate, deciduous, broadly oval, wider above the middle, with "eared" base; upper surface green, lower surface shaggy on young leaves and chalky-white on mature leaves. Flowers are one foot across, fragrant, petals white with large, purple splotch. Fruits are cone-like, 2 inches long, red maturing to brown, with red seeds held in small, open pockets. This species flowers in April. Multiple trunks, stout twigs, and large fallen leaves, which look like old paper bags on the ground, are distinctive in the winter. Habitat consists of rich upland hardwood forests of slopes, bluffs, and floodplains. This species is listed as endangered by the FDACS and is not listed by the USFWS.

Pyramid magnolia (*Magnolia pyramidata*) is a small tree or large shrub, 15 to 30 feet tall, similar to Ashe's magnolia usually with a single trunk. Pyramid magnolia has light gray bark, fragrant white flowers with narrow petals to 18 cm wide. Leaves are diamond-shaped with green undersurfaces, not exceeding 20 cm in length, tapering proximally then flaring into and eared or lobed base. This species flowers in April. Multiple trunks, stout twigs, and large fallen leaves, which look like old paper bags on the ground, are distinctive in the winter. Habitat consists of rich upland hardwood forests of slopes, bluffs, and floodplains. This species is listed as endangered by the FDACS and is not listed by the USFWS.

Giant water-dropwort (*Oxypolis filiformis greenmanii*) is an erect herb to about 6 feet tall, with a stout, sparsely-branched, heavily striated stem, hollow, rounded, conspicuously septate-jointed leaves that are brittle and easily disattached. The leaves and stems are suffused with a purplish pigment while the flowers are maroon and borne in conspicuous umbels. This species is found in marshes, roadside ditches, wet prairies, cypress ponds,

Hypericum ponds, bogs, swamps, hydric pine flatwoods, and savannahs. Giant water-dropwort is restricted to several counties in the Florida panhandle, including Bay, Calhoun, and Gulf Counties. This species is listed as endangered by the FDACS and is not listed by the USFWS.

Narrow-leaved phoebanthus (*Phoebanthus tenuifolius*) is a perennial herb with leaves that are numerous, simple, all cauline, and entire with a few of the lower most ones opposite and the others alternate. The leaves are linear or linear-filiform, scabrous-hispid and pustulate. The flowering head is solitary and terminating at the simple stem or with heads, 2 to 6, terminating at the branches. The flowering head is radiate with the rays being relatively large and yellow. The disk flowers are perfect and fertile and are yellow or red-purple. This species occurs in sandy pinelands and is listed as threatened by the FDACS and is not listed by the USFWS.

Apalachicola dragonhead (*Physostegia godfreyi*) is an herbaceous perennial with a slender rhizome. The stems are erect, up to 10 cm tall, and square in cross section. The leaves are opposite, narrowly elliptic, and 3 to 6 cm long. The leaf margins are mostly entire. The corolla is pale rose with darker purple veination on the throat. The fruit is an obovoid, angled, brown, nutlet that is about 3 to 4 mm long. Habitat consists of wet, wiregrass savannahs, hydric pine flatwoods, and bogs. This species is listed as threatened by the FDACS and is not listed by the USFWS.

Crystal Lake nailwort (*Paronychia chartacea* ssp. *minima*) is an annual herb with spreading, wiry stems rising from a stout taproot. Stems are either dense and compact (female-flowered plants) or with spindly, forking branches forming cross-shaped patterns (male-flowered plants). Leaves are tiny, opposite, papery, and scale-like with strongly inrolled margins. Flowers are tiny, with 5 white, deeply hooded sepals and no petals; in small clusters, 0.5 to 1.5 inches wide. This species is found in sandy openings around sandhill upland lakes and karst ponds. Crystal Lake nailwort is endemic to Bay and Washington counties in Florida. This species is listed as endangered by the FDACS and is listed as threatened by the USFWS.

Eastern ninebark (*Physocarpus opulifolius*) is a deciduous, several stemmed shrub 5 to 8 feet tall, with peeling, buff colored bark. Leaves are alternate, simple, ovate in general outline and highly variable. Flowers are white, sometimes tinged pink, borne in clusters at the ends of branches, showing April through June. This species is found on wooded stream banks and in mesic hammocks. Eastern ninebark is exclusively found across portions of Jackson and Calhoun Counties in Florida. This species is listed as endangered by the FDACS and is not listed by the USFWS.

Hairy fever tree (*Pinckneya bracteata*) is a large shrub or small tree to 10 m (20 feet) tall. Branches are opposite, with the bark reddish-brown to gray. Leaves are deciduous, opposite or whorled with petiole 1 to 3 cm long, softly pubescent, with the leaf blade oval, elliptic or ovate. Leaves are 4 to 20 cm long, 2 to 12 cm wide, soft and hairy with margins entire. This species is found on edges of bayheads, sloughs, swamps and bogs. throughout portions of north Florida from Jefferson County west to Washington County, also Marion and Clay

Counties in central Florida. Hairy fever tree is listed as threatened by the FDACS and is not listed by the USFWS.

Godfrey's butterwort (*Pinguicula ionantha*) is an insectivorous perennial herb with a rosette up to 6 inches wide. Leaves are fleshy, oblong, bright green, with inrolled edges and rounded tips, upper surfaces are covered with short, glandular hairs that exude a "greasy" substance and capture insects. Flower stalks are 4 to 6 inches tall, leafless, with glandular hairs. Flowers are nearly 1 inch across when fully open, lavender to white, with 5 spreading, notched petals; throat and tube darker purple with deep purple veins; spur 0.2 inch long, yellow to olive; palate (cylindrical structure protruding from flower center) yellow with purple base, covered with yellow hairs. This species is found on seepage slopes, bogs, transition zones between flatwoods and cypress stringers, roadside ditches, depressions in wet pine flatwoods, wet prairies and often in standing water. Godfrey's butterwort flowers from March to April and is endemic to the coastal Florida panhandle (Wakulla to Bay County). The species is listed as endangered by the FDACS and is listed as threatened by USFWS.

Yellow butterwort (*Pinguicula lutea*) is an insectivorous perennial herb similar to *Pinguicula ionantha* with a rosette up to 6 inches wide. Leaves are fleshy, oblong, yellowish-green, with inrolled edges and rounded tips, upper surfaces covered with short, glandular hairs that exude a "greasy" substance and capture insects. Flowers are nearly 1 inch across when fully open, bright yellow, with 5 spreading, notched petals; throat and tube darker purple with deep purple veins. This species is found in better-drained, rarely inundated habitats and occurs throughout Florida. Yellow butterwort is listed as threatened by the FDACS and is not listed by the USFWS.

Chapman's butterwort (*Pinguicula planifolia*) is a perennial herb with a rosette up to 6 inches wide. The leaves are slimy, fleshy, broad, and reddish, and the flowers are purple on 4 to 6 inches stalks. This species is found on seepage slopes, in bogs, transitional zones between flatwoods and cypress stringers, roadside ditches, depressions in wet pine flatwoods and wet prairies and usually flowers from March to April. Chapman's butterwort is listed as threatened by the FDACS and the USFWS encourages consideration during project planning.

Primrose-flower butterwort (*Pinguicula primulifolia*) is a perennial herb with a rosette up to 6 inches wide. The leaves are slimy, fleshy, oblong, and bright green, and the flowers have purple petals with a white ring above the throat and a yellow tube with reddish veins. The flowers are on 4 to 6 inches stalks and flowers from March to April. This species is found on seepage slopes, in bogs, transitional zones between flatwoods and cypress stringers, roadside ditches, depressions in wet pine flatwoods, and wet prairies. The species is listed as endangered by the FDACS and is not listed by USFWS.

Bent golden aster (zigzag silkgrass) (*Pityopsis flexuosa*) is a branched, silvery pubescent perennial herb, 20 to 50 cm tall with rhizomes 1–5 cm long. There are usually 1 to 6 stems, ascending, sometimes reddish brown, usually simple, flexuous, slender, moderately sericeous, and glabrescent. Basal leaves are equal to or shorter than cauline leaves. This species flowers from late summer through fall. Habitat is sandy, open soils, open pine-oak

woods, clearings and is known only from the vicinity of Tallahassee, Florida. Bent golden aster is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

Yellow fringed orchid (*Platanthera ciliaris*) is an herbaceous, glabrous perennial with fleshy tuberous roots and an erect stem with a few basal leaves and cauline leaves gradually reduced becoming bracteates. The plant can be up to 1 meter in height. Flowers are orange and showy with globous racemes of fringed flowers roughly 1 cm wide. Habitat includes wet flatwoods, seepage bogs, marshes, savannahs, lake and pond shores, along streams, sloughs, and moist ditches. Yellow fringed orchid is listed as threatened by the FDACS and is not listed by the USFWS.

Yellow fringeless orchid (*Platanthera integra*) is an herbaceous, glabrous perennial with fleshy tuberous roots and an erect stem with a few basal leaves and cauline leaves gradually reduced becoming bracteates. The plant can be up to 1 meter in height. Flowers are similar to the yellow fringed orchid without the fringe. Habitat includes wet flatwoods, seepage bogs, marshes, savannahs, lake and pond shores, along streams, sloughs, and moist ditches. Yellow fringeless orchid is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

Snowy orchid (*Platanthera nivea*) is an herbaceous glabrous perennial with fleshy tuberous roots and an erect stem to 1 m with a few basal leaves and cauline leaves gradually reduced becoming bracteates. Leaves are essentially sessile, linear-lanceolate with a sheathing base. Snowy orchid is the only white-flowering *Platanthera* species with an entire lip, the inflorescence and flowers the same size as other *Platanthera*. Habitat includes wet flatwoods, seepage bogs, marshes, savannahs, lake and pond shores, along streams, sloughs, and moist ditches. Snowy orchid is listed as threatened by the FDACS and is not listed by the USFWS.

Large-leaved jointweed (*Polygonella macrophylla*) has alternate, simple, obovate leaves that are 2 to 6 cm long and somewhat fleshy or rubbery to the touch. Flowers are small and pinkish to bright red, and because they are borne on racemes, their added effect makes them very showy during the fall. Habitat consists of deep white sands of the Florida panhandle ridges and relic dunes. Large-leaved jointweed is listed as threatened by the FDACS and the USFWS encourages consideration during project planning.

Small-flowered meadowbeauty (*Rhexia parviflora*) is a perennial herb up to 16 inches tall but usually shorter. Stems are square, and the leaves are 0.6 to 1.2 in long, opposite, oval with broadly pointed tips, sparsely hairy, with 3 conspicuous veins and finely toothed, hair tipped margins. The flower is less than 0.8 in across with 4 white (rarely pale pink), nearly round petals that fall easily. Habitat consists of seepage slopes, margins of dome swamps, depression marshes, and evergreen shrub ponds. Small-flowered meadowbeauty flowers from June through August. This species is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

Orange azalea (*Rhododendron austrinum*) is the only orange- or yellow-flowered azalea in Florida. Winter buds are hairy, and leaf margins have tiny teeth with short, spiky, transparent hairs that point toward the leaf tip. This species flowers from March through April. Habitat consists of upland hardwood forests and on bluffs and banks of streams in the Florida panhandle. The orange azalea is listed as endangered by the FDACS and is not listed by USFWS.

Chapman's rhododendron (*Rhododendron chapmanii*) is a deciduous shrub, 2 to 9 feet tall, with stiff, erect branches tipped by terminal buds. Young twigs, buds, and leaves are covered with small, round, rust colored scales. Leaves are 1 to 3 inches long, evergreen, alternate, wider above the middle, usually with inrolled margins. Pink flowers occur in showy clusters at tips of branches, each flower 0.5 to 1.5 inches long, with 5 lobes, and 10 stamens about the same length as the petals. Fruit comprise an elongated capsule about 0.5 inch long, present nearly year-round, covered with rusty scales. This species flowers from mid-March to mid-April. Shrubs are hard to see without flowers, but may be distinguished when not in flower from most other evergreen shrubs by rusty scales, elongated fruits, and terminal buds. Habitat consists of wet, mesic, or dry scrubby flatwoods; borders of titi or bay swamps, disturbed areas, and pine plantations. Chapman's rhododendron is listed as endangered by the FDACS and is listed as endangered by the USFWS.

St. John's Susan (*Rudbeckia nitida*) is a perennial herb with a single, stiff, erect, ribbed stem, occasionally branched, topped by a flower head. Stems are 20 - 60 inches tall, smooth, not hairy or waxy. Most leaves are basal, 4 to 20 inches long, 1 to 3 inches wide, entire or slightly toothed, with long leaf stalks; main veins conspicuous, extending to the leaf tip; leaves further up the stem are smaller and lack leaf stalks. Ray flowers are 1.25 to 2 inches long, bright yellow, drooping. Disk flowers are purplish-brown, on an elongated, conical disk, 0.75 to 1.5 inches tall. St. John's Susan flowers from May to July with a second flowering period September–October. Habitat consists of wet or mesic pine flatwoods, bogs, savannas, seepage slopes and roadside ditches. Only 1 of 13 known populations in Florida occurs on conservation land within Jennings State Forest. St. John's susan is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

White-top pitcher plant (*Sarracenia leucophylla*) is a perennial herb with hollow, tubular leaves (pitchers). The plant is 1 to 2 feet tall and 1 to 2 inches across the mouth. Pitchers are clumped and usually green with white tops and reddish or purple veins. Flowers are maroon. Habitat consists of openings in thickets along spring-fed streams, wet prairies, and bogs. The white-top pitcher plant is listed as endangered by the FDACS and the USFWS encourages consideration during project planning.

Hooded pitcher plant (*Sarracenia minor*) is a small, perennial herb with erect greenish to reddish, hollow, tubular leaves (pitchers) to about 14 inches tall that are completely covered by bronze-red hoods with prominent white spots. Flowers are yellow, drooping, and odorless. The hooded pitcher plant resembles red pitcherplant but, has yellow-green flowers and white patches near the top of the pitcher. Habitat consists of bogs, wet savannas, swamps, edges

on pond cypress and titi flats. The hooded pitcher plant is listed as threatened by the FDACS and is not listed by the USFWS.

Parrot pitcher plant (*Sarracenia psittacina*) is a small perennial herb with hollow, tubular leaves (pitchers) arranged in a rosette pattern. Leaves (pitchers) are green with the upper tube and strongly arched hood exhibiting areas of pale green, white, and purple reticulation. The flowers are maroon. Habitat consists of openings in thickets along spring-fed streams, wet prairies, and bogs. The parrot pitcher plant is listed as threatened by the FDACS and is not listed by the USFWS.

Decumbent pitcher plant (*Sarracenia purpurea*) is a perennial herb with hollow, tubular leaves (pitchers) that are green and bulbous (urn-like) with purple or purple-red venation. Hoods are erect, notched, and open to the sky. Flowers are deep maroon to rose pink. Habitat consists of openings in thickets along spring-fed streams, wet prairies, and bogs. The decumbent pitcher plant is listed as threatened by the FDACS and is not listed by the USFWS.

Mock pennyroyal (*Stachydeoma graveolens*) is a perennial herb or sub-shrub that is up to 20 inches tall with a short, woody stem and numerous upright, hairy branches. Leaves are 0.5 inches long, aromatic, opposite, oval, and lacking leaf stalks with the margins being entire or slightly toothed. Leaf surfaces are hairy with glistening amber glands. Flowers are solitary or with a few in the angle of leaf and stem near the top of the plant. The calyx is tubular, 2-lipped, 10-ribbed, glandular, and hairy. The flower is 0.5 inch long, pink, 2-lipped with the upper lip being 2-lobed and erect and the lower lip being 3-lobed and spreading downward. The flower has 2 fertile stamens, both with obvious anthers. Habitat consists of sandhills and drier areas in pine, palmetto, and wiregrass flatwoods. This species is listed as endangered by the FDACS and is not listed by the USFWS.

Florida skullcap (*Scutellaria floridana*) is a perennial herb with slender, weak stems, 1 to 2 feet tall. Stems are square, with a very narrow, clear wing along each angle. Leaves are less than 1.5 inches long, very narrow, with a blunt, purple tip; opposite and widely spaced on the stem; minutely gland-dotted, midrib raised beneath, margins inrolled. Flowers are 1 inch long, blue-purple, the upper lip with 3 lobes, the lower lip with 2 lobes and large white spot. The calyx has a small purplish “cap” (scutellum) that persists when the plant is in fruit. Unlike most mints, skullcaps are odorless. Habitat consists of wet pine flatwoods, grassy margins of cypress stringers, seepage slopes, and transition zones between flatwoods and wetlands. Florida skullcap is endemic to the Apalachicola River lowlands in the Florida panhandle. Florida skullcap is listed as endangered by the FDACS and threatened by the USFWS. This species was also identified as being proximal to Alternative Alignments in the FNAI-TNC Report (2001).

Thorne’s buckthorn (*Sideroxylon thornei*) is a shrub or small tree usually around 8 feet tall. The leaves are variable in size and shape with rounded or bluntly pointed tips and smooth or slightly wavy leaf margins. The undersurface of the leaf is densely tawny in spring and patchily hairy by late summer. The flowers are white with 5 petals. Habitat

consists of wet woods, streams or cypress ponds. Thorne's buckthorn is listed as endangered by the FDACS and is not listed by the USFWS.

Silky camellia (*Stewartia malacodendron*) is a deciduous shrub or small tree with membranous, entire or serrulate leaves that are 5 to 10 cm long and 2.5 to 5 cm wide. Leaves are widely elliptical and the leaf margins are ciliate. Flowers are approximately 5 to 7.5 mm wide and have 5 sepals and 5 white petals. Habitat consists of deciduous forests, low woods, and creek banks. This species flowers from May to June. The silky camellia is listed as endangered by the FDACS and is not listed by the USFWS.

Chapman's crownbeard (*Verbesina chapmanii*) is a perennial herb with wingless stems 16 to 32 inches tall, rough-hairy leaves, and heads with large disk flowers and no ray flowers. Leaves are 1.2 to 3.2 inches long, opposite, oblong to oval, rough-hairy, with small blunt teeth. Flowers in solitary heads on stiff, slender stalks; disk flowers few and are yellow. This species flowers from June through August. Habitat includes wet flatwoods and prairies. Chapman's crownbeard is listed as threatened by the FDACS and the USFWS encourages consideration during project planning.

Drummond's yellow-eyed grass (*Xyris drummondii*) is a small perennial herb which grows in small clumps and bases are often buried. Leaves are broadly linear, bases straw colored with dark, reddish patches. Scapes are round, somewhat twisted, spike base with two prominent green-keeled bracts. Flowers open in the morning. Lateral sepals are not exerted, their keels deep brown, mostly ciliate, strongly curved near tip. The plant flowers in the summer and fall. Habitat includes sandy peats of deep pineland bogs and around seep and bog edges. Drummond's yellow-eyed grass is not listed by the FDACS and the USFWS encourages consideration during project planning.

Quillwort yellow-eyed grass (*Xyris isoetifolia*) is a perennial herb growing in small, dense clumps. Leaves are 1.6 to 6 inches long, erect, narrow, wiry, pointed, twisted, and smooth; leaf bases are widened, brownish, and shiny. Flower stalk grows to 12 inches tall and are slightly twisted (without ridges); sheath at the base that is shorter than the leaves. Flower head is 0.2 to 0.3 inch long, oval, cone-like, composed of loosely overlapping, dark brown bracts with rounded tips. Flowers protrude from the tips of bracts, opening in the morning and withering by afternoon. Flowering occurs July through November. Habitat includes margins of karst ponds, sinkhole lakes, sandhill upland lakes, seepage slopes and bogs, and wet prairies. Quillwort yellow-eyed grass is not listed by the FDACS and the USFWS encourages consideration during project planning. This species was also identified as being proximal to Alternative Alignments in the FNAI-TNC Report (2001).

Karst (Kral's) yellow-eyed grass (*Xyris lonisepala*) is a perennial herb with a bulbous or nearly bulbous base and has flower stalks up to 3 feet tall, pinkish leaf bases, and fringed lateral sepals visible outside the bracts; flowers open mid-day. The plant flowers July through November. Habitat includes margins of karst ponds, sinkhole lakes, and sandhill upland lakes. Karst (Kral's) yellow-eyed grass is listed as endangered by the FDACS and is not listed by the USFWS.

Harper's yellow-eyed grass (*Xyris scabrifolia*) is a perennial herb with a bulbous or nearly bulbous base. Stems are compact with erect to ascending and leaves are 10 to 50 cm long. Sheaths are pinkish, rugulose, papillate, or scabrous to nearly smooth. The blade is dull green, linear, and slightly to very twisted. The plant flowers in the summer and fall. Habitat includes sandy peats of deep pineland bogs and around seep and bog edges. Harper's yellow-eyed grass is listed as threatened by the FDACS and is not listed by the USFWS.

SECTION 6 FIELD SURVEY & HABITAT EVALUATION METHODS

An initial desktop habitat evaluation of the study area was conducted based on interpretation of both historical and recent aerial photographs provided by FDEP Land Boundary Information System (Labins) 2004 Digital Orthophoto Quarter-Quadrangle (DOQQ) Aerial Photography (2004 Red, Green and Blue (RGB) State Plane). Proposed project corridors and alternative alignments were overlaid on aerial photos to identify potential involvement with listed species identified in Table 5.1. This general desktop analysis, project staff knowledge of the area, and results of preliminary field reconnaissance formed the rationale and basis for subsequent field surveys conducted within and in the vicinity of Alternative Alignments. When appropriate, specific survey protocols were utilized.

Reconnaissance field surveys were initially conducted within the originally proposed corridors and alignments. Surveys took place at various times (spring, early summer, late summer) between April and October 2007 and April and October 2009. The 2009 surveys were conducted for Alternative Alignments 14 and 17, which were added to the list of proposed alignments after the 2007 survey timeframes. Throughout the timeframe of the seasonal surveys (2007 and 2009), design changes were made to the proposed corridors and eventually the Alternative Alignments analyzed herein were established. Some of these changes to alignment placement were made, in part, to avoid areas determined to have a higher observed occurrence of listed species and/or suitable habitat. Additional seasonally-appropriate surveys may be warranted for the Preferred Alternative.

Finally, a 2001 report produced by TNC and FNAI identified 21 plant species in northwest Florida (“TNC-FNAI 21 Species Report”) that in their opinion, are in need of protection due to being rare and in danger of being extirpated due to being on private lands. Shapefiles were provided with the report that identified three areas on private lands in the study area that support rare communities including: Ridges of Gulf County (9,825 acres); Wetappo Creek South (3,543 acres), and Sandy Creek Bogs (6,998 acres). As described previously, the initial desktop evaluation conducted for this ESBAR included data from the most current FNAI report (2007) for the area. As the PD&E study progressed and field surveys were conducted across various alignments, proposed alignment footprints changed several times to address a variety of different potential impacts including those to listed species actually observed in the field.

The above referenced areas harboring rare plant communities were avoided to the greatest extent practicable during the PD&E stage of this project. The Ridges of Gulf County has been completely avoided. The majority of potential involvement with Sandy Creek Bogs and Wetappo Creek South are associated with existing paved highways, SR 22 and CR 386, respectively. Of the “21 most imperiled species” identified by FNAI and TNC, only four species are located within the “3 Rare Plant Areas” and three of these species are state listed (*Aster spinulosus* – currently *Eurybia spinulosus*, *Eriocaulon nigrobactatum*, and *Xyris isoetifolia*). The only federally-listed plant is Florida skullcap, which was located four miles east of Alternative Alignment 8/14/15.

The “TNC-FNAI 21 Species Report” was developed at a coarse scale for the entire panhandle (Jefferson County to Alabama). Surveys conducted by project biologists (see below) were more current and thorough, as was the project-specific FNAI Report. The results of the data synthesis and field reconnaissance indicated that listed plant species occurrences within the respective alignments and buffers and potential involvement was minimal. As is the case with all FDOT projects, listed and even rare (un-listed species) will be avoided and impacts minimized to the extent practicable. Depending on the alternative selected, it is possible that there may be very minimal involvement with the areas identified as having rare species. Commitments related to listed plants can be found in Section 10.2.

As described in Section 5, a potential pool of 122 listed species was identified (Table 5.1). Of the fifty seven (57) wildlife species, 21 are federally-listed (endangered or threatened), one (1) is a federal candidate species (red knot), one (1) is protected by other federal acts (bald eagle), 23 are state listed (endangered, threatened, or species of special concern), and 11 have a “consideration encouraged” designation. Of the 65 plant species included in Table 5.1, eight (8) are federally-listed, 52 are state listed, and five (5) are identified as “consideration encouraged”. While the focus of desktop and field surveys was on federally-listed wildlife and plants, and state-listed wildlife species, project biologists were instructed to be cognizant of all 122 species.

Upon further examination of individual species habitat requirements, current habitat conditions, and alignment locations, it became apparent that many of the 57 wildlife species identified in Table 5.1 had a low likelihood of occurring within Alternative Alignments or their associated buffers. Therefore, field survey methods described below are limited to those species that could be reasonably expected to occur within or in the vicinity of alternative alignments.

Gopher Tortoise

Prior to conducting field surveys, a desktop analysis using NRCS soil data, ESRI® World Prime Aerial Imagery, and FLUCFCS data was performed to identify areas containing suitable gopher tortoise soil and habitat types across the originally proposed alignments. In instances where suitable gopher tortoise habitat types and soil types overlapped, the potential for optimal gopher tortoise habitat increased. Gopher tortoise survey areas were distributed across 15 percent of each suitable and optimal habitat type resulting in 37 survey areas. The 37 gopher tortoise survey areas were surveyed for gopher tortoise burrows on September 20 and 21, 2007 (Figure 30 in Appendix A). Linear transects were established and all burrows recorded within each survey area according to standard FFWCC guidelines available at the time of the surveys. Additional gopher tortoise burrow observations were made proximal to the initial alignment survey areas; however, such observations should be considered ancillary, as no formal survey methodology was followed. As additional alignments were considered, desktop analyses were run. However, in the case of these additional alignments, gopher tortoise surveys were performed in conjunction with seasonally-specific vegetation field surveys and were focused in optimal gopher tortoise habitat.

Florida black bear

Florida black bear habitat (various forested wetland and upland communities) is found throughout the GCP study area. While no specific surveys were conducted for this species during this PD&E study, project biologists were instructed to note any evidence of bears when conducting wetlands assessments and surveys for other listed species.

Listed Plant Species Field Surveys

Survey methods utilized existing FNAI occurrence data and photo interpretation to identify specific environmental features and access points relative to property ownership and access, i.e. walking, four-wheeler, vehicle observation. Field survey methods were developed from *USFWS Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (May 2006). Field data sheets were developed from the FNAI field Report Form for Occurrences of Rare Plants, Animal, and Natural Communities.

Prior to conducting the seasonal field surveys, a matrix was developed that listed all potentially occurring federal and state listed species in the project vicinity along with their appropriate seasonal flowering period. Field maps were created using the aforementioned data sets and used in the field for cross referencing. A listed-plant photo guide was also developed to complement the listed-plant species matrix and used in the field to identify plant species. Project biologists also utilized several plant identification manuals, books, and plant keys in the field. Additional field surveys may be warranted for the Preferred Alternative as various environmental permit applications are developed. Coordination with resource agencies will occur as necessary to ensure appropriate survey methods are used. Additional information concerning listed plant species surveys are described below.

Background information on listed plants was obtained by conducting field investigations at known regional reference populations to obtain visual images of target species and associated habitats. The reference populations examined in the field included:

1. **Hwy 65 Wildflower Preservation Plots, Liberty County.** On April 3, 2007, a team of scientists visited a known reference population of listed species associated with the SR 65 Wildflower Preservation project in Liberty County. The species observed included the federally-listed Harper's beauty and Godfrey's butterwort among other listed species. Godfrey's butterwort was in flower during the site visit, but Harper's beauty was not. Plants were located along a roadside swale adjacent to the ANF.
2. **ANF.** On May 16, 2007, project biologists accompanied Louis Kim (USDA Forest Service) to several known reference populations containing listed species within ANF. ANF has an active and comprehensive prescribed burning program. Federally-listed species examined within their appropriate habitat together with associated species included Harpers beauty and white-birds-in-a-nest. State listed species included Chapman's crownbeard, Florida beargrass (*Nolina atopocarpa*) and Apalachicola dragonhead. Harpers beauty, Florida beargrass and Apalachicola dragonhead were in flower during the site visit. Plants were located in several habitats including fire maintained wet pine flatwoods, wet prairies, ecotonal areas adjacent to

titi/bay swamps, cypress strands, roadside swales and a maintained powerline right-of-way.

3. Harpers Beauty Site, Bay County. Project biologists visited a known, isolated population of Harper's beauty in Bay County on May 23, 2007 when it was in bloom. The plant was observed within its appropriate habitat while in flower and fruit.

4. St. Joseph Bay State Buffer Preserve (SJBSBP). On May 31, 2007, project biologists conducted a reference site visit accompanied by Jean Huffman (Refuge Manager, FDEP St. Joe Bay State Buffer Preserve). Federally-listed species examined in their appropriate habitat included telephus spurge, Florida skullcap, Chapman's rhododendron and white-birds-in-a-nest. State listed species included Godfrey's goldenaster (*Chrysopsis godfreyi*), narrow-leaved Phoebanthus (*Phoebanthus tenuifolius*), Chapman's crownbeard, tropical waxweed (*Cuphea aspera*), thicketleaf water-willow (*Justicia crassifolia*), pinewoods bluestem (*Andropogon arcatus*) and bog tupelo (*Nyssa ursina*). The Florida skullcap, narrow-leaved Phoebanthus and Florida waxweed were in flower during the site visit. The telephus spurge was in fruit. The plants were located in a variety of habitats that ranged from fire maintained wet pine flatwoods to dry coastal scrub.

To initialize field surveys within the GCP Alternative Alignments, data related to elemental occurrences from FNAI and proposed alignment boundaries were loaded into a Trimble Global Positioning System (GPS) unit with sub-meter accuracy. Aerials were printed for use in the field to key in on specific habitat features and verify survey locations. Permission was obtained from large area landowner(s) prior to access when surveys were conducted outside of public lands and/or road right-of-ways.

Field surveys were generally conducted with two scientists (with at least one staff member per team with experience in local flora surveying and monitoring). Visual surveys were conducted on foot, with the use of all-terrain four-wheelers and four wheel drive vehicles depending on specific conditions. Pedestrian surveys consisted of walking transects through each habitat type defined during the initial habitat evaluation to ensure representative coverage of the project area was surveyed. Transect locations were field-determined based on reasonable scientific judgment as opposed to being randomly distributed or systematically installed. Some areas of dense vegetation required more transects for adequate coverage, while areas in the urban portions of the project area required fewer transects.

In addition, during seasonal surveys, certain habitat types within alternative alignments were accessed to target listed species occurrences. As these habitat types were surveyed and a listed species was observed, the location was recorded as an EO point, located via GPS, and photographed. Data collected included habitat type, approximate number of individuals, and associated species.

GPS data were downloaded and processed with differential correction using GPS Pathfinder Office 3.10. When field surveys were completed, all data collected was uploaded to

ArcMap™ 9.2 GIS. FLUCFCS types and boundaries identified during the initial habitat evaluations were refined based on data collected in the field. All observed occurrences of listed species were plotted. Alternative alignment boundaries were overlaid onto the field data collected to estimate impacts to observed listed species, potentially occurring listed species, and associated habitat.

SECTION 7 FIELD SURVEY RESULTS

Sixteen (16) listed species (one wildlife and 15 plant species) were observed by project biologists within Alternative Alignment boundaries and/or associated buffers. A discussion of findings can be found below, in Table 7.1, and in Figures 31-42 in Appendix A.

Gopher Tortoise Gopher tortoise habitat surveys (37 survey areas/plots) yielded one abandoned burrow within Survey Area 26, just east of Sandy Creek (Figure 30 in Appendix A). Survey Area 26 contained preferred planted pine habitat conditions and numerous food sources including wiregrass, gopher apple, and prickly pear cactus (*Opuntia* spp). Additional inactive and abandoned burrows and preferred habitat conditions were also observed adjacent to Survey Area 26. No additional active or inactive burrows were found within any of the other Survey Areas associated with Alternative Alignments. The Alternative Alignment associated with Survey Area 26 was ultimately dropped from consideration and therefore, the abandoned burrow will be avoided.

Many areas traversed during gopher tortoise and vegetation surveys were dominated by planted pine stands, with dense canopy cover and minimal evidence of periodic prescribed fire. Preferred gopher tortoise food sources, e.g., grasses and herbaceous plants, were infrequent or absent on many of the survey areas. Even in areas with suitable to optimal habitat conditions, no “potentially occupied” burrows were found. For instance, survey areas 18 and 21 contained adequate habitat and food sources, including numerous broadleaf grasses, gopher apple, and prickly pear, yet no gopher tortoises or gopher tortoise burrows were observed.

Florida Black Bear

FFWCC has identified locations of known Florida black bear kills along Star Avenue, SR 22, CR 386, and along US 98 (SR 30) near the TAFB and Mexico Beach (Figures 43-54 in Appendix A). Evidence of Florida black bear occurrence (individuals, tracks, scat, etc.) was observed across the GCP study area, within buffers associated with Alternative Alignment 15 at one location, and within the boundaries of Alternative Alignments 17/19 at two locations.

Table 7.1
Listed Species and Species Elements Observed by Project
Biologists within Alternative Alignments or Associated 300-foot Buffers

Scientific Name	Common Name	Element	Alignment									
			8		14		15		17		19	
			Align	Buffer	Align	Buffer	Align	Buffer	Align	Buffer	Align	Buffer
<i>Asclepias viridula</i>	Southern Milkweed	Individual Plants			1		1					
<i>Drosera intermedia</i>	Spoon-leaved Sundew	Individual Plants		1	2	3		1	1		1	2
<i>Hymenocallis henryae</i>	Henry's Spiderlily	Individual Plants	1	1					1	1		
<i>Macbridea alba</i>	White Birds-in-a-nest	Individual Plants	1		1		1					
<i>Oxypolis filiformis greenmanii</i>	Giant Water Drop-wart	Individual Plants	2	3	2	3	2	3		2		2
<i>Phoebanthus tenuifolius</i>	Narrow-leaved Phoebanthus	Individual Plants	1	1	1	1	1	1				
<i>Physostegia godfreyi</i>	Apalachicola Dragonhead	Individual Plants	2		3		2					
<i>Pinguicula ionantha</i>	Godfrey's Butterwort	Individual Plants		1						1		
<i>Pinguicula lutea</i>	Yellow Butterwort	Individual Plants	1						1			
<i>Polygonella macrophylla</i>	Large-leaved Jointweed	Individual Plants	1	1	1	1	1	1				
<i>Sarracenia psittacina</i>	Parrot Pitcher Plant	Individual Plants	5	5	7	5	4	4	1	2		2
<i>Sarracenia purpurea</i>	Decumbent Pitcher Plant	Individual Plants			2	2			1		1	1
<i>Scutellaria floridana</i>	Florida Skullcap	Individual Plants	1	1	1	1	1	1				
<i>Stachydeoma graveolens</i>	Mock Pennyroyal	Individual Plants					1					
<i>Ursus americanus floridanus</i>	Florida Black Bear	Scat and Tree Scratch Marks						1	2		2	
<i>Verbesina chapmanii</i>	Chapman's Crownbeard	Individual Plants		1		1		1				
Total			15	15	21	17	14	13	7	6	4	7

White birds-in-a-Nest

The range of white-birds-in-a-nest (federally-listed) is limited to Bay, Gulf, Franklin, and Liberty Counties with the largest populations being located in the ANF. The FNAI report listed multiple occurrences of this species (dating back to 1988) along portions of Alternative Alignments 8, 14, and 15. One occurrence of this species was observed within Alternative Alignments 8/14/15. Another occurrence was observed within an alignment that was later dropped from consideration.

Godfrey's Butterwort

This member of the bladderwort family is limited to Bay, Franklin, Gulf, and Liberty counties. FNAI data indicates several occurrences of Godfrey's butterwort (federally-listed) in the vicinity of the GCP study area. Three occurrences of this species were observed within the study area. One occurrence was located beyond the buffer areas associated with Alternative Alignments and one occurrence was located within buffers associated with Alternative Alignments 8/17.

Florida Skullcap

Florida skullcap (federally-listed) is an herbaceous mint endemic to the Apalachicola River lowlands with its range limited to Franklin, Gulf, and Liberty Counties. Only one occurrence of this species is listed in the FNAI report for the study area. One occurrence was located within the buffer areas associated with Alternative Alignments 8/14/15 and the other occurrence was located within Alternative Alignments 8/14/15.

Southern Milkweed

Southern milkweed is a perennial herb from a thickened rootstock. Southern milkweed occurs in wet flatwoods and prairies, seepage slopes, and pitcher plant bogs and is endemic to the Florida Panhandle and northeast Florida; however, it is now mainly found in the ANF, where about 30 populations are protected. Two occurrences were observed during field surveys. One occurrence was observed within Alternative Alignment 14, and one occurrence observed within Alternative Alignment 15.

Spoon-leaved Sundew

Spoon-leaved sundew was observed during the 2007 and 2009 spring field investigations within the GCP study area. This species is found throughout the GCP study area as it is widespread throughout bogs, hydric savannas, wet ditches and hydric pine flatwoods. The spoon-leaved sundew was also located within roadside depression areas adjacent to wet planted pine stands. Approximately 10 to 50 individuals were estimated to be present in most areas where the species was observed. This species was observed within alignment footprints and/or buffers associated with Alternative Alignments 8, 14, 15, 17, and 19. This species was also observed at several locations corresponding with other alignments no longer under consideration.

Henry's (Panhandle) Spiderlily

Two occurrences of Henry's (Panhandle) spiderlily associated with Alternative Alignments 8/17 were observed during field investigations. One occurrence was located within alignment boundaries and the other was located in the associated buffer area. All occurrences were located within a *Hypericum* (St. John's wort) bog growing alongside sweet pepperbush (*Clethra alnifolia*). Its' typical habitat is wet flatwoods, edges of cypress stringers and ponds.

Giant Water-Dropwort (Cowbane)

This species is narrowly endemic to the Florida panhandle in association with the lower Apalachicola River and generally restricted to Bay, Calhoun and Gulf Counties. The habitat generally consists of roadside ditches, bogs, wet flatwoods and cypress depressions. This species was found at several locations within alignment footprints and/or buffers associated with Alternative Alignments 8, 14, 15, 17, and 19 as well as several areas outside the boundaries of Alternative Alignments.

Narrow-leaved Phoebeanthus

This species is narrowly endemic to a few counties in the central parts of the Florida panhandle but is not uncommon in the ANF (Nelson, 2005). Its habitat includes flatwoods, sandhills, and sandy pinelands. FNAI records show two occurrences of this species in the GCP study area. Six occurrences of this species were observed within the GCP study area during field surveys. Four of these occurrences were located beyond the buffer areas associated with Alternative Alignments. One occurrence was located within Alternative Alignments 8/14/15 and one occurrence was located within the buffer area for Alternative Alignments 8/14/15.

Apalachicola Dragonhead

This herbaceous perennial is limited to approximately five Florida counties west of the Ochlockonee River. It is listed at several locations on the FNAI report with the majority of occurrences observed within nearby TAFB. Ten occurrences were observed within the study area. Seven of these occurrences were beyond the buffer areas associated with Alternative Alignments. Two occurrences were located within Alternative Alignments 8/14/15 and a third occurrence was located in Alternative Alignment 14.

Yellow Butterwort

Yellow Butterwort is the only butterwort in the East Gulf Coastal Plain that has distinctly yellow flowers. It is found in savannas, wet flatwoods, roadside ditches, seepage bogs, and wet road shoulders. One occurrence of this species was observed within Alternative Alignments 8/17.

Large-leaved Jointweed

Large-leaved jointweed is found in habitat consisting of deep white sands of the Florida panhandle ridges and relic dunes. Two occurrences of this species were observed. One occurrence was located outside the buffer areas associated with Alternative Alignments. One occurrence was located within Alternative Alignments 8/14/15 and one occurrence was located within the buffers associated Alternative Alignments 8/14/15.

Parrot Pitcher Plant

Parrot Pitcher Plant is one of the more widespread pitcher plants in the East Gulf Coastal Plain, and is typically found in habitats that include wet savannas, bogs, wet pinelands, roadside ditches, and the edges of swamps and bays. It was typically observed in mowed roadside ditch/swales associated with Alternative Alignments. This species was found at several locations within alignment footprints and/or buffers associated with Alternative Alignments 8, 14, 15, 17, and 19 as well as several areas outside the boundaries of Alternative Alignments.

Decumbent Pitcher Plant

Decumbent pitcher plant habitat includes bogs, savannas, and moist to wet roadsides. Nine occurrences of this species were observed during field surveys. Six of these occurrences were outside the buffer area associated with Alternative Alignments. Two occurrences were within Alternative Alignment 14, and one occurrence was within Alternative Alignments 17/19, and two occurrences were located within the buffers associated with Alternative Alignments 14/19.

Mock Pennyroyal

Mock pennyroyal is a small upland aromatic mint found in sandhills or drier areas in pine-palmetto-wiregrass flatwoods. About 50 populations are known to exist with most being in the ANF (FNAI, 2000). The FNAI report data indicates several occurrences of this species in the GCP study area with most of the occurrences being located in the vicinity of SR 22. Two occurrences were observed during field surveys. One occurrence, a significant population of between 100 to 1000 individuals, was observed beyond the buffers associated with Alternative Alignments. The other occurrence was within Alternative Alignment 15.

Chapman's Crownbeard

Chapman's crownbeard is endemic to about six counties in the central parts of the Florida panhandle (Nelson, 2005). FNAI EO records show this plant occurs in the GCP study area and within Tyndall Air Force. Three occurrences associated with Alternative Alignments 8, 14, and 15 (buffer areas) were observed during field investigations.

SECTION 8 DETERMINATION OF EFFECTS

As previously described in Section 5 and summarized in Table 5-1, 122 listed species were originally considered. Two additional state-listed plants were identified by project biologists during field surveys. A “determination of effects” (DE) was conducted for a subset of these species, i.e., federally-listed and state-listed wildlife species, and federally-listed plant species. Determinations were based on several criteria including best available data and/or information stemming from direct field observations by project biologists, publically available occurrence data, desktop analyses, and published information regarding species distributions and habitat associations. A total of 48 species meeting the criteria above were considered and a DE was made for each species. No species under consideration were assigned a DE of “may affect, likely to adversely affect”. It was determined that all five Alternative Alignments would have “no effect” on 20 species (11 federally listed, 1 other federally-protected, and 8 state listed) and “may affect, but is not likely to adversely affect” 14 species (3 federally listed and 11 state listed). It was also determined that 14 species were split with respect to their potential involvement with Alternative Alignments (10 federally listed and 4 state listed). For example it was determined that three Alternative Alignments (8, 14, 15) would have “no effect” on the five sea turtle species under consideration while Alternative Alignments 17 and 19 “may affect, but is not likely to adversely affect” the species’. These five turtle species along with the other eight species were ultimately assigned a “may affect, but is not likely to adversely affect” DE. For species having a designation other than “no effect”, Best Management Practices (BMP) and species-appropriate protection measures such as pre-construction training and worksite signage may be employed as appropriate (See Section 10 for additional details).

FISH

Gulf sturgeon

While the Gulf sturgeon’s range borders the GCP study area along the Gulf of Mexico, no Critical Habitat has been designated within the GCP study area including the eastern-most portion of East Bay. FNAI data does not identify any documented occurrences within or proximal to the GCP study area. According to the FNAI report, matrix unit 7024 (1 square mile), which is located west of Alternative Alignment 15, has the “potential for Gulf sturgeon” since the matrix unit lies within the known or predicted range of the species (closest waterbody is a tributary to Bayou George Creek). Specific surveys for Gulf sturgeon were not conducted for this PD&E study. Based on the information reviewed in this study, on-site conditions, proposed actions, and implementation of the *Construction Special Provisions Gulf Sturgeon Protection Guidelines* during construction (Appendix B), FDOT concludes that the subject project **may affect, but is not likely to adversely affect** the federally-threatened Gulf sturgeon. In a correspondence on May 18, 2011 USFWS could concur with this finding as long as the commitment to the *Construction Protection Provisions Sturgeon Protection Guidelines* is upheld.

Shoal bass

Preferable shoal bass habitat consists of fast-moving shoal areas of rivers and larger tributaries. Distribution within Florida includes limestone shoal areas of the Chipola and Apalachicola Rivers. No EO data provided by FNAI or field observation data indicated

potential direct or indirect impacts to this species within Alternative Alignments or associated buffers. None of the Alternative Alignments are associated with the Apalachicola River. In addition, the portion of Alternative Alignments¹⁵ that straddles the western boundary of Calhoun County is outside the watershed boundary of the Chipola River. Based on the information reviewed in this study, on-site conditions, proposed actions, and the intent to limit wetland impacts to the greatest extent practicable, FDOT concludes that the subject project will have **no effect** on this state-listed species of special concern.

Bluenose shiner

Preferable bluenose shiner habitat consists of quiet backwaters and pools of blackwater streams and rivers, usually associated with thick vegetation. No EO data provided by FNAI or field observation data indicated potential direct or indirect impacts to this species within Alternative Alignments or associated buffers. Although suitable habitat exists, since this species is highly mobile, potential impacts would be unlikely. As such, FDOT concludes that the subject project **may affect, but is not likely to adversely affect** this state-listed species of special concern.

AMPHIBIANS AND REPTILES

American alligator/crocodile

The GCP study area is outside the range of the American crocodile. Furthermore, no American alligators were observed during field surveys for T&E species and wetlands. Given this information, the inherent mobility of this species, and the intent to limit wetland impacts to the greatest extent practicable, FDOT concludes that there will be **no effect** on the federally-threatened American alligator as a result of the subject project. In a correspondence on May 18, 2011 USFWS did not have a specific discussion on concurrence for this species and has stated that upon submittal of the FEIS and the selection of a preferred alternative concurrence can be provided.

Reticulated flatwoods salamander (RFS)

A desktop habitat evaluation modeled after the analysis used by HDR (2001) was conducted to identify potentially suitable FWS breeding pond habitat. GIS was primarily utilized to conduct desktop analyses across all five Alternative Alignments and their associated buffers (Figures 55-65 in Appendix A). Specific data layers employed in the analyses included photo-interpreted wetlands and FLUCFCS maps. The following FLUCFCS types occurring in the study area were identified as potentially suitable for RFS breeding ponds provided that they were isolated: 620, 621, 630, and 640. Wetland types such as salt marshes (FLUCFCS 642) were considered unsuitable. Photo-interpreted wetlands and potential RFS FLUCFCS habitats were intersected and the resultant polygons were considered. Finally, the polygons resulting from the intersection were reviewed in conjunction with 1953 and 2004 aerial photography to identify isolated, wetland depressional areas of 10 acres or less. Additional photo-interpretation was conducted to classify the type of potential breeding habitat identified (cypress dome, isolated ponds, etc.) and to review the surrounding habitat type, as well as to identify any similar wetland features in the general vicinity.

Alternative Alignments 8/14/15 had the highest number of potential ponds (11) within the alignment footprint and Alternative Alignments 17 (1) and 19 (2) had the lowest. With respect to potential indirect involvement (potential breeding ponds located within 1,500 feet of alternative alignments), Alternative Alignment 15 (17 ponds) and Alternative Alignment 14 (16) had the highest and Alternative Alignment 17 (4) and Alternative Alignment 19 (7) had the lowest.

No specific field surveys were conducted with respect to scoring or grading potential RFS habitat. However, it was generally observed during limited field reconnaissance surveys for wetlands and other listed species surveys that overall RFS habitat conditions (vegetation structure and composition of the pond environment, ecotone, and surrounding uplands) were of low quality. The majority of alternative alignment area associated with this project is in Bay County. No RFS critical habitat has been designated in Bay County and no known occupied or appropriate unoccupied habitat is located within an appropriate dispersal distance of a known population to allow for natural recolonization of RFS in Bay County (Federal Register 2009). The project will not likely impact any potential breeding ponds as there is a low potential for the salamander or its habitat associated with alternative alignments. Given the number of corridors and alignments considered and assessed for this project, along with the length of each typical alternative, e.g. \pm 30 miles, RFS assessments using the HDR Method were limited to Phase I for all potential ponds within 1,500 feet of said alternatives. In light of this, FDOT agrees to conduct a Phase II RFS field evaluation (per the HDR Method) for a representative sample of potential ponds within 1,500 feet of the preferred alternative during design and permitting. A re-assessment of the DE for the preferred alternative will be based on the results of the Phase II field evaluation and has been added as a commitment. Based on the data and information reviewed to date, FDOT concludes that the project **may affect, but is not likely to adversely affect** the federally-endangered RFS.

In a correspondence on May 18, 2011 USFWS recommended completing a Phase II field evaluation of all potential ponds once a preferred alternative is selected.

The FDOT has determined the project “may affect” the RFS. The FDOT intends to reinitiate consultation with the Service for the RFS (pursuant to section 7 of the Act, as described in 50 CFR § 402.14) after the public hearing and during development of the final NEPA document (or final design and permitting of the project) once all agency and public comments have been received and evaluated and a preferred alternative has been selected. At that time the Service will work with the FDOT to minimize the projects impacts to the RFS. Satisfaction of all Section 7 consultation requirements will occur and be document in the final NEPA document. If for some reason consultation must be reinitiated during final design and permitting, FDOT will complete all Section 7 consultation and document compliance in a subsequent project reevaluations prior to the project beginning construction. Consistent with 23 CFR 771.133, completion of Section 7 consultation at a later phase of project development is a commitment by FDOT.

Gopher Tortoise

Gopher tortoise and vegetation surveys indicate the potential for involvement with gopher tortoises across all Alternative Alignments. Standard FFWCC gopher tortoise permitting guidelines will be implemented for the Preferred Alternative, e.g., surveys of an appropriate design will be required prior to any relocations. Given the low number of burrows found by biologists, relative gopher tortoise habitat conditions, and the flexible permitting through FFWCC associated with relocating potentially affected gopher tortoises, FDOT concludes that this project will have **no effect** on the state-listed gopher tortoise.

In a correspondence on May 18, 2011 USFWS did not have a specific discussion on concurrence for this species and has stated that upon submittal of the FEIS and the selection of a preferred alternative concurrence can be provided.

Eastern Indigo Snake

Potential indigo snake habitat (upland and wetland) was found within the GCP study area. No specific surveys were conducted for this species during this PD&E study and no individuals were observed during surveys for other species and/or during wetlands evaluations. The low number of gopher tortoise burrows found within the study area is also noteworthy given indigo snake usage of gopher tortoise burrows. With implementation of the *Standard Protection Measures for the Eastern Indigo Snake* (Appendix B) during construction, FDOT concludes that the subject project **may affect, but is not likely to adversely affect** the federally-threatened eastern indigo snake.

In a correspondence on May 18, 2011 USFWS could concur with this finding as long as the commitment to incorporate the *Standard Protection Measures for the Eastern Indigo Snake* during construction is upheld.

Florida Pine Snake

No specific surveys were conducted for Florida pine snake and no occurrences were recorded during general reconnaissance surveys and surveys for gopher tortoises. Due to the relationship this species has with the gopher tortoise (use of its burrows) and habitat conditions within the GCP study area, FDOT concludes that this project will have **no effect** on this state-species of special concern. Per FFWCC guidelines, all commensal species (such as the Florida pine snake) captured during potential gopher tortoise relocation efforts will be relocated to a certified, long-term gopher tortoise recipient site.

Gopher frog

Gopher frog habitat is found within the GCP study area. No specific surveys were conducted for this species during this PD&E study. No gopher frogs were observed during general reconnaissance surveys and surveys for gopher tortoises. Due to the relationship this species has with gopher tortoise (use of its burrows) and habitat conditions within the GCP study area, FDOT concludes that this project will have **no effect** on this state-designated species of special concern. Per FFWCC guidelines, all commensal species (such as the gopher frog) captured during potential gopher tortoise relocation efforts will be relocated to a certified, long-term gopher tortoise recipient site.

Sea Turtles (loggerhead, green, leatherback, hawksbill, Kemps' ridley)

Given that the proposed southern termini for all Alternative Alignments are located north of US 98 and no impacts are anticipated south of this road (beach side), no impacts to the five (5) federally-listed sea turtles or their specific nesting habitat is expected. There is a possibility for involvement with some or all of these sea turtles with respect to the potential bridging of East Bay associated with Alternative Alignments 17/19. Given that this would not involve nesting habitat, the relative mobility of these species, and the potential for juvenile sea turtles to occasionally utilize bays and estuaries, any impacts would be unlikely. Potential effects of the project on these sea turtles in-water will be coordinated with National Oceanic Atmospheric Administration (NOAA). A commitment to work with USFWS on a wildlife-friendly lighting plan is included in Section 10.2 Since a preferred alternative has yet to be selected, FDOT concludes that the subject project **may affect, but is not likely to adversely affect** these federally-listed sea turtles.

The FDOT has determined the project “may affect” the Sea Turtles. The FDOT intends to reinitiate consultation with the Service for the Sea Turtles (pursuant to section 7 of the Act, as described in 50 CFR § 402.14) after the public hearing and during development of the final NEPA document (or final design and permitting of the project) once all agency and public comments have been received and evaluated and a preferred alternative has been selected. At that time the Service will work with the FDOT to minimize the projects impacts to the Sea Turtles. Satisfaction of all Section 7 consultation requirements will occur and be document in the final NEPA document. If for some reason consultation must be reinitiated during final design and permitting, FDOT will complete all Section 7 consultation and document compliance in a subsequent project reevaluations prior to the project beginning construction. Consistent with 23 CFR 771.133, completion of Section 7 consultation at a later phase of project development is a commitment by FDOT.

Freshwater Turtles (Barbour's map turtle, alligator snapping turtle, Suwannee cooter)

These three freshwater turtles generally prefer habitat consisting of rivers, large streams, and canals. They tend to build nests on high banks, berms, and sandbars above the floodplain. Specific surveys for these species were not conducted and no individuals were observed during field surveys. No EOs were identified by FNAI within Alternative Alignment boundaries or buffers. The relatively high number of small, freshwater streams associated with Alternative Alignments suggests that involvement with these species is unlikely. Minimizing impacts to wetlands along with the relative mobility of these species should reduce potential impacts to these species. Based on these factors, FDOT concludes that the subject project **may affect, but is not likely to adversely affect** any of these state-species of special concern.

BIRDS

Red-cockaded woodpecker (RCW)

RCW habitat evaluations were centered on aerial photo interpretation of known populations and their proximity to Alternative Alignments. Habitat conditions proximal to known RCW populations were noted during field surveys for wetlands and other listed species. Specific field surveys for RCWs or cavity trees were not conducted.

Two RCW populations are associated with the GCP study area. Lathrop Bayou Management Area (LBMA) is being protected and enhanced by Bureau of Land Management (BLM) and The St. Joe Company where a small population of RCWs is located on Raffield Island (Figure 32 in Appendix A). LBMA is located at the east end of East Bay, between two GCP Alternative Alignments (17/19 and 8/14/15) and includes 539 acres of late-successional, longleaf pine flatwoods. Approximately 22 cavity trees have been identified in a cluster on Raffield Island with a total of five birds banded as of December 2002. Alternative Alignments 17/19 are located approximately 6,000' west of the LBMA RCW cluster. The Wetappo Creek Conservation Area (WCCA) is located on St. Joe property in north Gulf County, just west of Wewahitchka, off of SR 22. WCCA comprises approximately 1,500 acres of late-successional longleaf pine habitat and currently supports eight RCW clusters (population goal of 10 active clusters) (St. Joe 2007). Alternative Alignments 8/14/15 are located approximately 1 mile (5,280') west of the WCCA. The LBMA and WCCA RCW populations are threatened by small numbers of birds and genetic isolation. Plans to translocate birds from other RCW populations to improve genetic diversity in both populations are included in the overall management plan for both properties (United States Department of Interior {USDOI}, 2003). Publically-available data does not indicate the presence of any other RCW groups other than the Wetappo Creek and Lathrop Bayou clusters.

In addition to these two RCW populations, two documented historic RCW cavity trees/clusters (circa 1980) were identified by FNAI along SR 22 in Gulf County in the vicinity of Oliver's Creek near the junction of Alternative Alignments 17/19 and 8/14/15 (Figure 34 in Appendix A). Limited reconnaissance along this section of SR 22 along with desktop analyses indicated that these cavity trees are no longer present as the habitat is dominated by various planted pine stands approximately 10-25 years old.

RCW habitat typically consists of contiguous stands of longleaf, loblolly, slash, and or pond pine ranging in age between 30-120 years old. Younger stands provide foraging habitat while older stands serve as potential sources of cavity trees. RCW clusters (aggregation of cavity trees) generally comprise about 10 acres. Associated foraging habitat to support RCW groups is contained within an adjacent area extending to 0.5 mile with most foraging habitat preferably found within 0.25 mile of the cluster (USFWS 2003). Extensive forested tracts characterized by planted pine stands dominate the landscape adjacent to the WCCA. LBMA is surrounded by East Bay on three sides and is adjacent to planted pine stands similar to those described above along its southeastern border. These planted pine stands are generally 10-25 years old and are overburdened with midstory shrubs which, results in a vegetation

structure unfavorable to RCWs. Alternative Alignments are located well beyond the 0.5-mile RCW foraging territory boundary.

The USFWS has expressed concerns about the potential for the Gulf Coast Parkway to fragment habitat that separates these two RCW populations. The Lathrop Bayou and Wetappo Creek RCW populations are located approximately eight miles from each other. The St. Joe Company has a Memorandum of Understanding (MOU) with BLM that addresses the management of both RCW populations (Lathrop Bayou and Wetappo Creek). Nothing in the MOU indicates that these two populations are “connected”. None of the alternatives would have an effect on the management of either RCW nesting and/or foraging habitat for both the Wetappo Creek or Lathrop Bayou RCW populations. In addition, the land between these two populations is predominantly forested (planted pine 10-25 years old) and primarily, if not entirely, privately owned. While private landowners may choose to manage their land to benefit listed species, e.g., RCWs, they are not required to do so. Based on habitat conditions in the study area and biological requirements of the species, i.e., foraging territories extend out 0.5 mile from a cluster, potential direct or other effects related to “fragmentation” are not anticipated.

FDOT submits that an adequate assessment of the habitat conditions associated with alternative alignments and the overall habitat context of the study area has been conducted. In light of these findings, FDOT concludes that the subject project will have **no effect** on the federally-endangered RCW.

Wood stork

Specific surveys for wood storks were not conducted as a part of this PD&E study. No wood storks were observed by field crews while conducting wetland assessments and listed-species surveys. Although there is potential wood stork foraging habitat within the GCP study area, there is no documented CFA located within the GCP study area. In fact, the nearest wood stork CFA is located in Leon County, Florida approximately 50 miles east of the GCP study area. Based on this and the fact that any wood storks observed in the study area would be “transient”, FDOT concludes that the subject project will have **no effect** on the federally-endangered wood stork.

In a correspondence on May 18, 2011 USFWS stated that they could concur with a determination that the proposed alternatives may affect, but are not likely to adversely affect the wood stork. The District agrees with this change.

Bald eagle

The wetland areas around East Bay meet the food, cover, reproductive and habitat requirements of the bald eagle. Specific field surveys were not conducted for bald eagle nests. FFWCC was consulted to determine if active bald eagle nesting sites are located within the study area. One active nest was identified within less than a mile of the study area - LBMA on Big Pine Island (Figures 33 and 35 in Appendix A).

This nest is located in Section 22, Township 05S, Range 12W (latitude 30.0283 and longitude -85.434). Bald eagles have utilized this nest since 1991 and it was last surveyed as

active in 2006. This is one of the oldest active nests in Bay County and is located approximately 3,000 feet from Alternative Alignments 17/19. The LBMA is being protected and enhanced for wildlife under a Management Plan developed by the BLM, Department of the Interior. A documented inactive nest is located west of Allanton Point (latitude 30.036 and longitude -85.483) approximately 8,200 feet west of Alternative Alignments 17/19. This nest was last active in 2003. Another documented inactive bald eagle nest is located adjacent to East Bay County Line Road, just east of Sandy Creek. This nest is located in Section 03, Township 05S, Range 12W (latitude 30.0715 and longitude -85.4169) approximately 14,000 feet east of Alternative Alignments 17/19. This eagle nest was last active in 2004.

The proposed project has suitable habitat for bald eagles. There is one (1) active bald eagle nest within one mile (approximately 3,000 feet) of Alternative Alignments 17/19. Due to this nest being well beyond the primary management zone established for bald eagle nests (660 feet), FDOT concludes that the subject project will have **no effect** on the bald eagle. In the event that a bald eagle constructs a nest near the Preferred Alignment prior to or during construction activities, National Bald Eagle Management Guidelines will be followed.

Arctic Peregrine Falcon

Peregrine falcons rely on a constant and plentiful abundance of birds, their primary food source. This species usually requires open spaces for hunting. Common habitats where peregrines have been documented include coastal and barrier island shorelines, river margins, sloughs, marshes, and in urban areas with adequate prey. No falcons were observed during field surveys and FNAI does not identify any nest locations within Alternative Alignment boundaries or buffers. Impacts to this species are not expected based on these factors and the mobility of this species. Therefore, FDOT concludes that the subject project will have **no effect** on this state-endangered bird.

Marian's marsh wren

No specific surveys were conducted for this species and no individuals were observed during field surveys for wetlands and other listed species. No EOs were reported by FNAI within Alternative Alignment boundaries or buffers. Potential habitat for the Marian's marsh wren was observed with the study area. Based on these factors and the mobility of this species, involvement is not expected. Therefore, FDOT concludes that the subject project will have **no effect** on this state-species of special concern.

Florida sandhill crane

No specific surveys were conducted for this species and no individuals were observed during field surveys. No EOs were reported by FNAI within Alternative Alignment boundaries or buffers. In addition, the Florida sandhill crane is rarely seen west of Taylor County, Florida (FNAI 2001), which is approximately 100 miles east of the GCP study area. Based on these factors, involvement with this species is not expected. Therefore, FDOT concludes that the subject project will have **no effect** on this state-threatened species.

Southeastern American Kestrel

Kestrels nests during mid March through June, typically in abandoned woodpecker cavities or man-made cavities. Preferred kestrel habitat comprises sparsely-stocked canopies or

overstories and low growing, open understories. This species feeds mainly on insects and lizards, although it occasionally consumes small rodents and birds. No individuals were observed during the field surveys and no nests were identified by FNAI within Alternative Alignment boundaries or buffers. Impacts to this species are not expected based on these factors and the mobility of this species. Therefore, FDOT concludes that the subject project will have **no effect** on this state-threatened bird.

Shorebirds (piping plover, Southeastern snowy plover, least tern, black skimmer, American oystercatcher)

Given that the proposed southern termini for all Alternative Alignments are located north of US 98 and no impacts are anticipated south of this road (beach side), no impacts to the federally-threatened piping plover, specific nesting habitat, or critical habitat are expected. Foraging habitat and possibly small areas of potential nesting habitat may be present in various shoreline locations associated with East Bay. As such, there is a possibility for involvement with some or all of these shorebirds with respect to the potential bridging of East Bay associated with Alternative Alignments 17/19. Based on the published data reviewed, impacts to the shorebird species listed above are unlikely. Since a preferred alternative has yet to be selected, FDOT concludes that the subject project **may affect, but is not likely to adversely affect** these bird species.

The FDOT has determined the project “may affect” the Shorebirds. The FDOT intends to reinitiate consultation with the Service for the Shorebirds (pursuant to section 7 of the Act, as described in 50 CFR § 402.14) after the public hearing and during development of the final NEPA document (or final design and permitting of the project) once all agency and public comments have been received and evaluated and a preferred alternative has been selected. At that time the Service will work with the FDOT to minimize the projects impacts to the Shorebirds. Satisfaction of all Section 7 consultation requirements will occur and be document in the final NEPA document. If for some reason consultation must be reinitiated during final design and permitting, FDOT will complete all Section 7 consultation and document compliance in a subsequent project reevaluations prior to the project beginning construction. Consistent with 23 CFR 771.133, completion of Section 7 consultation at a later phase of project development is a commitment by FDOT.

Wading Birds (little blue heron, tricolored heron, and snowy egret)

Suitable habitat for these three (3) state species of special concern is found in various locations across the GCP study area. None of these highly mobile species were observed during any field surveys. Based on the published data reviewed, impacts to these wading bird species are unlikely. Therefore, FDOT concludes that the subject project **may affect, but is not likely to adversely affect** any of these bird species.

Water Birds (limpkin, brown pelican)

Suitable habitat for these two (2) state species of special concern is found in various locations across the GCP study area. None of these highly mobile species were observed during any field surveys. Based on the published data reviewed, impacts to these water bird species are unlikely. Therefore, FDOT concludes that the subject project **may affect, but is not likely to adversely affect** any of these bird species.

MAMMALS

Beach Mice (Choctawhatchee beach mouse and St. Andrew beach mouse)

Potential habitat for beach mice is located south of US 98. The proposed southern termini for all Alternative Alignments are located north of US 98. None of the Alternative Alignments (proposed right-of-way and associated 300-foot buffers) will involve beach mice, potential habitat, or critical habitat. While platted developments located within the study area contain potential beach mouse habitat, each has existing conservation plans to address potential impacts (See ICE Report in EIS). Therefore, FDOT concludes that the subject project will have **no effect** on either the federally-endangered Choctawhatchee beach mouse or the St. Andrew beach mouse.

West Indian Manatee

Although unlikely, West Indian manatees could be impacted during construction of a potential bridge crossing of East Bay associated with Alternative Alignments 17/19. Manatee protection measures and BMPs will be employed throughout the construction phase should this be the Preferred Alternative (Appendix B). Based on these protection measures plus the relative mobility of this species, FDOT concludes that this project **may affect, but is not likely to adversely affect** this federally-endangered species.

In a correspondence on May 18, 2011 USFWS could concur with this finding as long as the commitment to incorporate the *Standard Manatee Conditions for In-water Work* for bridge construction is upheld.

Florida Black Bear

Florida black bear habitat (various forested wetland and upland communities) is found throughout the GCP study area. No specific surveys were conducted for this species during this PD&E study. Evidence of bear occurrence (individuals, tracks, scat, etc.) was observed across the GCP study area, within Alternative Alignment buffers, and within the boundaries of Alternative Alignments 17 and 19. FFWCC has identified locations of known Florida black bear kills along Star Avenue, SR 22, CR 386, and along US 98 (SR 30) near the TAFB and Mexico Beach (Figures 43-54 in Appendix A). As a result of these observations, adjustments were made to some of the Alternative Alignments to reduce and minimize potential impacts to higher quality bear habitat. Future field surveys may be necessary to further analyze the potential impact to Florida black bear and associated habitats for the Preferred Alternative. Increased vehicular traffic and habitat fragmentation will likely occur for any of the Alternative Alignments. Potential wildlife crossings and other mitigation measures will likely be necessary for the Preferred Alternative. Based on published data and observations by project biologists, FDOT concludes that the subject project **may affect, but not likely to adversely affect** the state-threatened Florida black bear.

INVERTEBRATES

Mussels (fat threeridge, Chipola slabshell, purple bankclimber, shinyrayed pocketbook, Gulf moccasinshell, oval pigtoe)

Six (6) freshwater mussel species potentially associated with the GCP study area are federally-protected. Five (5) of these mussel species have Critical Habitat that is relegated to portions of Gulf and Calhoun Counties that are outside the boundary of the GCP study area. Specific surveys for mussels were not conducted as a part of this PD&E study and no FNAI EOs are reported within Alternative Alignment boundaries or buffers. Impacts to these species are not expected based on these factors. Given this, FDOT concludes that the subject project will have **no effect** on these federally-listed mussels.

Panama City Crayfish

The western portions of all five Alternative Alignments are located within the PCC's known range. A desktop analysis of potential involvement with PCC habitat was conducted by using GIS to examine PCC range and occurrence data (obtained from the FFWCC) and NRCS Soil Survey data in relation to Alternative Alignments. Documented occurrences (based on data sources above) were tallied per Alternative Alignment. To determine potential involvement with this species, core and secondary soils were also identified and quantified. Based on this desktop analysis, Alternative Alignments 14/15/19 potentially involve 15.3 acres of core soils and 21.1 acres of secondary soils. Alternative Alignments 8/17 potentially involve 46.2 acres and 72.8 acres of core and secondary soils, respectively (Table 8.1).

Table 8.1
PCC Core and Secondary Soils within Alternative Alignments.

PCC Core Soil Type	Acres within Alternative Alignments 14/15/19	Acres within Alternative Alignments 8 & 17
Pantego		3.9
Pelham sand		14.4
Plummer sand	4.4	14.4
Rutledge sand	10.9	13.5
Total	15.3	46.2
PCC Secondary Soil Type		
Albany	21.1	45.3
Leefield		27.5
Total	21.1	72.8
Grand Total Core & Secondary Soils	36.4	119.0

FNAI did not identify any PCC within Alternative Alignment boundaries. Data from FFWCC identified 19 PCC occurrences within Alternative Alignments 8/17 and two occurrences within Alternative Alignments 14/15/19 (Figure 66 in Appendix A). Project biologists observed crayfish burrows (species unknown) in roadside ditches adjacent to Star Avenue and Tram Road.

Based on desktop analyses, western portions of all five Alternative Alignments potentially involve approximately 15 to 46 acres of core PCC soils. PCC occurrence data provided by FFWCC indicated that all five Alternative Alignments could potentially involve PCC. Coordination with FFWCC and site-specific surveys will likely be required to update and refine PCC occurrence data related to the Preferred Alternative. The referenced management plan (FFWCC 2007) is still a draft. According to the FFWCC website (accessed on October 16, 2012, <http://myfwc.com/wildlifehabitats/imperiled/listing-process/>), the draft management plan will be finalized by spring 2013. Any potential conservation measures for this state-listed species will be addressed by the project sponsor and FFWCC. Based on this information and the status of the species, FDOT concludes that this project **may affect, but is not likely to adversely affect** this state-species of special concern.

PLANTS

White birds-in-a-nest

One occurrence of this species was observed within Alternative Alignments 8/14/15. Another occurrence was observed within an alignment that was later dropped from consideration. Given that a preferred alternative has not been selected, the number of occurrences, and the potential to avoid the species entirely, FDOT concludes that the subject project **may affect, but is not likely to adversely affect** the federally-threatened white birds-in-a-nest.

The FDOT has determined the project “may affect” the White birds-in-a-nest. The FDOT intends to reinitiate consultation with the Service for the White birds-in-a-nest (pursuant to section 7 of the Act, as described in 50 CFR § 402.14) after the public hearing and during development of the final NEPA document (or final design and permitting of the project) once all agency and public comments have been received and evaluated and a preferred alternative has been selected. At that time the Service will work with the FDOT to minimize the projects impacts to the White birds-in-a-nest. Satisfaction of all Section 7 consultation requirements will occur and be document in the final NEPA document. If for some reason consultation must be reinitiated during final design and permitting, FDOT will complete all Section 7 consultation and document compliance in a subsequent project reevaluations prior to the project beginning construction. Consistent with 23 CFR 771.133, completion of Section 7 consultation at a later phase of project development is a commitment by FDOT.

Godfrey’s Butterwort

Three occurrences of this species were observed within the GCP study area. One occurrence was located beyond the buffer areas associated with Alternative Alignments and one occurrence was located within buffers associated with Alternative Alignments 8/17. Given that a preferred alternative has not been selected, the number of occurrences, and the potential to avoid this species entirely, FDOT concludes that the subject project **may affect, but is not likely to adversely affect** the federally-threatened Godfrey’s butterwort.

The FDOT has determined the project “may affect” the Godfrey’s Butterwort. The FDOT intends to reinitiate consultation with the Service for the Godfrey’s Butterwort (pursuant to section 7 of the Act, as described in 50 CFR § 402.14) after the public hearing and during development of the final NEPA document (or final design and permitting of the project) once all agency and public comments have been received and evaluated and a preferred alternative has been selected. At that time the Service will work with the FDOT to minimize the projects impacts to the Godfrey’s Butterwort. Satisfaction of all Section 7 consultation requirements will occur and be document in the final NEPA document. If for some reason consultation must be reinitiated during final design and permitting, FDOT will complete all Section 7 consultation and document compliance in a subsequent project reevaluations prior to the project beginning construction. Consistent with 23 CFR 771.133, completion of Section 7 consultation at a later phase of project development is a commitment by FDOT.

Florida skullcap

One occurrence was located within the buffer areas associated with Alternative Alignments 8/14/15 and the other occurrence was located within Alternative Alignments 8/14/15. Given that a preferred alternative has not been selected, the number of occurrences, and the potential to avoid the species entirely, FDOT concludes that the subject project **may affect, but is not likely to adversely affect** the federally-endangered Florida skullcap.

The FDOT has determined the project “may affect” the Florida skullcap. The FDOT intends to reinitiate consultation with the Service for the Florida skullcap (pursuant to section 7 of the Act, as described in 50 CFR § 402.14) after the public hearing and during development of the final NEPA document (or final design and permitting of the project) once all agency and public comments have been received and evaluated and a preferred alternative has been selected. At that time the Service will work with the FDOT to minimize the projects impacts to the Florida skullcap. Satisfaction of all Section 7 consultation requirements will occur and be document in the final NEPA document. If for some reason consultation must be reinitiated during final design and permitting, FDOT will complete all Section 7 consultation and document compliance in a subsequent project reevaluations prior to the project beginning construction. Consistent with 23 CFR 771.133, completion of Section 7 consultation at a later phase of project development is a commitment by FDOT.

A summary of species DEs per alternative alignment can be found in Table 8.2 below.

Table 8.2
Determination of Effect for Species Potentially Affected by Alternative Alignments

Common Name	Listing Status*	FLUCFCS Type	Basis for DE	Alternative Alignment (DE)				
				8	14	15	17	19
Gulf sturgeon	FT	510, 541	Habitat + Database	NE**	NE	MANLAA***	MANLAA	MANLAA
Green turtle	FE	541	Habitat + Database	NE	NE	NE	MANLAA	MANLAA
Leatherback turtle	FE	541	Habitat + Database	NE	NE	NE	MANLAA	MANLAA
Hawksbill turtle	FE	541	Habitat + Database	NE	NE	NE	MANLAA	MANLAA
Kemp's ridley turtle	FE	541	Habitat + Database	NE	NE	NE	MANLAA	MANLAA
Loggerhead turtle	FT	541	Habitat + Database	NE	NE	NE	MANLAA	MANLAA
Piping plover	FT	642	Habitat + Database	NE	NE	NE	MANLAA	MANLAA
White bird's-in-a-nest	FT	814W, 817W, 832W	Observed (Individual Plants)	MANLAA	MANLAA	MANLAA	NE	NE
Godfrey's butterwort	FT	814W, 817W, 832W	Observed (Individual Plants)	MANLAA	NE	NE	MANLAA	NE
Florida skullcap	FT	814W, 817W, 832W	Observed (Individual Plants)	MANLAA	MANLAA	MANLAA	NE	NE
West Indian manatee	FE	510, 541	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Reticulated flatwoods salamander	FE	620, 621, 630, 640	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Indigo snake	FT	410, 434, 441, 443, 620, 630	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Southeastern snowy plover	ST	642	Habitat + Database	NE	NE	NE	MANLAA	MANLAA
Least tern	ST	642	Habitat + Database	NE	NE	NE	MANLAA	MANLAA

Common Name	Listing Status*	FLUCFCS Type	Basis for DE	Alternative Alignment (DE)				
				8	14	15	17	19
Black skimmer	SSC	642	Habitat + Database	NE	NE	NE	MANLAA	MANLAA
American oystercatcher	SSC	642	Habitat + Database	NE	NE	NE	MANLAA	MANLAA
Florida black bear	ST	441W, 614, 620, 621, 630, 814W, 817W, 832W	Observed (bear sign)	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Little blue heron	SSC	640, 641, 510, 524	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Tricolored heron	SSC	640, 641, 510, 524	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Snowy egret	SSC	640, 641, 510, 524	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Limpkin	SSC	640, 641, 510, 524, 630, 621	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Brown pelican	SSC	541, 642,	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Barbour's map turtle	SSC	510, 510D	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Alligator snapping turtle	SSC	510, 510D	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Suwannee cooter	SSC	510, 510D	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Panama City crayfish	SSC	641, 814W, 817W, 832W	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Bluenose shiner	SSC	510	Habitat + Database	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Total MANLAA				17	16	17	26	25
Total Federal Species MANLAA				6	5	6	11	10

* FE=Federally Endangered, FT=Federally Threatened, FO=Federal Other, SE=State Endangered, ST=State Threatened, SSC=Species of Special Concern (state)

** NE: No Effect

*** MANLAA: May Affect, but is Not Likely to Adversely Affect

Based on species observed by project biologists (Table 7.1), it is clear that all five Alternative Alignments will likely have potential effects on listed species – mainly state-listed plants. While these field observations are informative, they were limited and opportunistic (governed by property access) and primarily serve to support the overall assessment of effects on species. A much wider array of species and habitat data (including that presented in Table 7.1) were assessed in Section 8 (DE Table 8.2). Results of that analysis provide a more complete picture and indicate that, Alternative Alignments 17 and 19 have the highest potential for effects on listed species while Alternative Alignments 8, 14, and 15 have the lowest.

SECTION 9 INDIRECT AND CUMULATIVE EFFECTS

Given the extent of wetlands identified within the study area, ICE will likely occur to adjacent wetlands regardless of Alternative Alignment. In addition, upland habitat will also be impacted. Detailed and comprehensive assessments of ICE have been conducted for wetlands (see WER) and listed species.

Indirect effects are a by-product of direct effects or impacts. Indirect effects are manifested in the reasonably foreseeable future or some distance away from the location of direct impacts. Indirect effects could include future development, changes in land use, and/or changes in population dynamics that as a result, have the potential to affect natural resources. In this region of Florida, regulatory agencies require an assessment of indirect effects concerning wetland resources and listed species within approximately 300 feet of Alternative Alignment boundaries. Potential indirect effects associated with this project could include water quality degradation from stormwater runoff or roadway spills, changes in hydrology (alteration of hydroperiods due to more impervious surfaces), edge effect impacts from filling wetlands, habitat fragmentation and potential changes in wildlife utilization, increased constraints on implementing prescribed burning management plans, and creation of a conduit/corridor (roadway) for exotic/invasive species range expansion. FDOT has a right-of-way maintenance program that encourages native plant diversity and habitat connectivity. FDOT also has a program that considers the management/control of invasive/exotic species <http://www.dot.state.fl.us/statemaintenanceoffice/invasivespecies.shtm>.

In addition, the introduction of new roads has the potential to fragment habitat and impact associated wildlife. The degree of potential impact is largely dependent upon the size of the road corridor (wide roads having greater impact than relatively narrow roads), the relative position of the road corridor within the landscape, the relative condition of the habitat being traversed (new roads vs. widening an existing road), and life history needs of potentially affected wildlife species. Wildlife species such as the Florida black bear may also be indirectly impacted in response to the potential fragmenting of habitat. All five Alternative Alignments are characterized by a mix of road widening, new alignments, and new stream crossings. Alternative Alignments 17 and 19 would also involve a new bridge crossing a portion of East Bay.

Cumulative impacts on the environment result from the combination of the project's direct and indirect effects plus the effects of foreseeable past, present, and future actions within the area of interest. In order to facilitate the assessment of potential induced growth resulting from the GCP project, an expert panel of land-use planners with intimate knowledge of the study area was assembled from both the public and private sectors. This expert panel met and interacted via the Delphi Technique in order to obtain as unbiased an estimate as possible of potential population growth for the study area given the Alternative Alignments and the No-Build Alternative. Locations of predicted induced growth developed by the expert panel were analyzed to determine potential impacts on socioeconomic, natural, and physical environments. In addition to data derived from the "Delphi Group", various datasets supplied by FDOT, e.g., LRTP Improvement Program, were also considered in gauging

potential ICE related to the GCP project. The results of the analysis will be summarized in the EIS and detailed in the GCP ICE Report.

SECTION 10 AVOIDANCE, MINIMIZATION, CONSERVATION MEASURES AND COMMITMENTS, AND MITIGATION

10.1 POTENTIAL AVOIDANCE AND MINIMIZATION MEASURES

Throughout the PD&E study, proactive measures such as conducting multiple habitat assessments (desktop and field) were used to avoid and/or minimize potential impacts to listed species. Every alignment currently under consideration was shifted/modified (where feasible) to varying degrees in order to avoid and/or minimize impacts to higher quality wetland and upland habitats that are more likely to harbor relatively high numbers of listed species. It is important to note that such “shifts and modifications” were also balanced against potential involvement with other resources such as wetlands and cultural resources. Furthermore, avoidance and minimization measures were also utilized in earlier stages of the PD&E process when additional corridors and alignments were dropped from consideration based upon potential resource impacts and public input.

10.2 CONSERVATION MEASURES AND COMMITMENTS

Potential conservation measures and commitments under consideration are based on agency comments/input and include:

- Conducting pre-construction surveys at the appropriate time for listed species to enhance assessments concerning location and population status. For example, since gopher tortoise burrows and habitat found within alternative alignments and associated 300-foot buffers may be impacted, FFWCC Gopher Tortoise Permitting Guidelines pertaining to surveying, excavating, and relocating will be followed once a preferred alternative is selected.
- Avoiding potential impacts to manatees. Depending upon the methodology used for bridge installation, potential protection measures could include stopping work if a manatee comes within a specified distance of in-water work, posting observers to watch for manatees, and/or monitoring turbidity barriers for potential entanglement. “*Standard Manatee Conditions for In-Water Work, 2011*”, developed by the FFWCC and USFWS will be followed, as necessary. If explosives are to be utilized, then the “Guidelines for the Protection of Manatees and Sea Turtles during the Use of Explosives in the Waters of the state of Florida” will also be implemented.
- Minimizing direct/indirect wetland impacts, e.g., sedimentation, by utilizing appropriate stormwater design and BMPs at wetland and stream crossings during construction. Regulatory agencies will have the opportunity to review 60% plans that will include the proposed design for crossing structures via the joint Environmental Resource Permit (ERP) application. The 60% plans submitted with the ERP

application will also contain a design erosion control plan that will be subject to regulatory agency review and comment. Design plans will follow NFWMD regulations requiring that an operating permit be obtained for the constructed stormwater facilities.

- If seasonally-appropriate surveys for federally-listed plants potentially associated with the preferred alternative are conducted, the project sponsor will avoid and minimize potential impacts to listed plants to the extent practicable.
- Implementing *Standard Protection Measures for the Eastern Indigo Snake* during construction.
- Implementing *Construction Special Provisions Gulf Sturgeon Protection Guidelines* during construction.
- Conducting a Phase II RFS field evaluation for a representative sample of potential ponds within 1,500 feet of the preferred alternative during design and permitting. A re-assessment of the DE will be based on the results of the Phase II field evaluation.
- Utilizing “sea turtle friendly” lighting strategies on bridges and coordinating with USFWS as necessary.
- Facilitating movement of black bears via wildlife crossings, if deemed necessary.
- Utilizing signage informing motorists of potential wildlife hazards, e.g., deer and bear crossings, if deemed necessary.
- Per the suggestion of the USFWS, a survey for bald eagle nests within the Preferred Alternative and associated buffers will be conducted one year prior to construction.

10.3 PROPOSED MITIGATION MEASURES

Avoidance and minimization of potential wetland and surface water involvement was central to both corridor and alignment development. Direct involvement with wetlands and surface waters (creeks, streams, ditches) will occur as a result of roadway construction activities. Recognizing this, efforts have been made throughout the PD&E process via desktop analyses and subsequent field surveys to identify routes that may result in fewer wetland impacts – especially those potentially involving higher quality wetlands. During the project design phase, jurisdictional wetlands will be field-delineated resulting in a more detailed assessment of wetland involvement (quantity and quality) for the Preferred Alternative. These detailed field assessments may facilitate further reductions in potential wetland involvement through minor shifts of the Preferred Alternative, if practicable. Direct and indirect wetland impacts will be minimized through appropriate stormwater design, and utilization of BMP at wetland, bay, and stream crossings (especially East Bay and Wetappo Creek) during construction, e.g.,

any potential bridge work would adhere to FDOT's *Standard Specifications for Road and Bridge Construction*.

Mitigation will be required for direct and indirect wetland impacts. At this point in project development, FDOT is not prepared to state definitely how impacts to wetlands will be mitigated due to the varying types and locations of resources that could be impacted. It is unknown as to the degree, type, or location of mitigation that will be required until permitting requirements for the Preferred Alternative are evaluated. FDOT will reserve use of multiple mitigation methods, e.g., statute approved mitigation (in-lieu fee program), mitigation banks located near the proposed project, and/or property donations, since the efficiency in acquiring, appropriateness, and value of available wetland credits/offsets are critical to selecting the most appropriate method(s) (373.4137 Florida Statutes {FS}). In many cases involving FDOT projects, wetland impacts are mitigated by purchasing mitigation credits from the NFWFMD via the Northwest Florida Umbrella, Watershed-based, Regional Mitigation Plan or "Umbrella Plan". The Umbrella Plan was established in 2006 by an agreement between NFWFMD and USACE (Jacksonville District). Operated as an in-lieu fee program, it is an outgrowth of the NFWFMD's responsibility under FS to provide mitigation for FDOT impacts to wetlands regulated by federal and state code. Delineated by seven major riverine watersheds, the NFWFMD jurisdiction covers 16 counties (including Bay, Gulf, and Calhoun Counties) and extends from east of Tallahassee to west of Pensacola. With the Umbrella Plan, watershed resources and mitigation needs are identified upfront in a comprehensive manner. The Umbrella Plan establishes a process by which wetland mitigation projects are strategically identified at a watershed scale evaluated, and approved by consensus of the USACE-led Interagency Review Team. Using a mitigation credit ledger, credits may be used to offset future wetland impacts such as those potentially stemming from the GCP project.

However, wetland impacts which result from the construction of this project will be mitigated *pursuant* to Section 373.4137, F.S. to satisfy all mitigation requirements of Part IV. Chapter 373, F.S. and 33 U.S.C. s. 1344. Compensatory mitigation for this project will be completed through the use of mitigation banks and any other mitigation options that satisfy state and federal requirements. As mitigation methods pursuant to Section 373.4137, FS have been approved by the permitting agencies as an accepted mitigation process, the following paragraph's discussions are provided to illustrate that at a conceptual mitigation level all alternatives for the Gulf Coast Parkway project have an acceptable and available means for mitigating their wetland impacts.

A critical aspect of securing wetland mitigation concerns the amount, type, and timing of wetland impacts. Wetland involvement associated with the GCP project is contained within the St. Andrews-St. Joseph Bays watershed (hydrologic unit = 03140101; "subject watershed"). At this stage of the project, i.e., PD&E level, potential wetland involvement has been estimated based upon desktop analyses and field reconnaissance/assessments (Uniform Mitigation Assessment Methods {UMAM} functional loss scores ranged between 203 and 349). As mentioned above, several mitigation options are currently available to FDOT. According to data housed and maintained by the USACE Regulatory In-lieu fee and Bank Information Tracking System (<http://geo.usace.army.mil/ribits/index.html>; accessed March 9,

2012) and the NFWFMD Wetland Programs websites (<http://www.nwfwmdwetlands.com/index.php?Page=11>; accessed March 9, 2012), it appears that four existing private mitigation banks (Breakfast Point, Devils Swamp, Sweetwater, Nokuse) and seven NFWFMD/umbrella bank sites (Sandhill Lakes, Wards Creek, Wards Creek West, Cat Creek, Devil's Hole, Point Washington, Lynn Haven,) have service areas that include the subject watershed. In addition, one proposed private mitigation bank (Bear Creek) includes the subject watershed in its service area. As of March 9, 2012, the 11 existing mitigation banks/sites identified above collectively have approximately 600 palustrine wetland credits currently available. None of these existing banks/sites appear to provide estuarine credits.

It is important to recognize the temporal nature of mitigation credits and how inventories are affected by demand. While the availability of credits “today” is noteworthy, it is unclear as to the actual time they will be needed for this project. It is possible that credits available today from existing mitigation banks and sites may still be available at the time needed - the opposite situation is also possible for some or all of the banks and mitigation sites active “today”. However, new banks may come on line between now and the time credits are actually needed (design and permitting phase) for this project. Given the high percentage of undeveloped land in this part of Florida, it is also clear that numerous opportunities for future mitigation sites exist. Finally and in the event that this project results in impacts to estuarine wetlands and estuarine credits are not available, available out-of-kind credits may be utilized for such wetlands per regulatory agency approval.

10.4 REQUIRED PERMITS

The need for some, if not all, potential wildlife and/or plant permits will not be determined until a preferred alternative is selected and additional species surveys are conducted. Necessary permits will be sought from appropriate federal and state agencies at that time.

SECTION 11 AGENCY CONSULTATIONS

In February 2007, the GCP project was submitted into Efficient Transportation Decision Making (ETDM). ETAT comments were submitted and subsequently reviewed and incorporated into alignment-level analyses. Details concerning ETAT comments can be found at: <https://etdmpub.fl-a-etat.org/est/> project 7559. After ETAT review of the proposed project in the Environmental Screening Tool (EST), the FFWCC and the USFWS responded with the following comments concerning wildlife and habitat:

- *FFWCC – An EIS is recommended to address issues of adverse effects to natural resources, the public interest, controversial aspects requiring high agency interaction, and potential for irreversible impacts to the environment including ICE. An interagency Environmental Advisory team is also recommended, as well as participation in the Scoping Process, to address riparian system protection, need for wildlife underpass structures, runoff, population and movement surveys, and PCC mitigation.*
- *USFWS – Impacts to protected species must be minimized or avoided, potentially through bridging, habitat acquisition / restoration, developmental balance, limited access, and growth management. In accordance with the Endangered Species Act, direct, indirect, and cumulative effects to species and habitat must be determined; this includes the RCW, flatwoods salamander, bald eagle, PCC, and protected and rare plants. Habitat fragmentation, habitat corridors, and wildlife crossings are also issues of concern, as are potential effects to migratory birds. Finally, lighting in coastal environments must be compliant with sea turtle protection.*

On April 20, 2011, a copy of the Draft ESBAR was submitted to the USACE, USFWS, NMFS, FFWCC, and NFWFMD for their review. Comments submitted by these agencies have been addressed in the ESBAR and other technical documents. Additionally, agency comments have been addressed in appropriate sections of the EIS.

On May 1, 2007, a field review of the GCP study area was conducted. The purpose of the field review was to give agency representatives from USFWS the opportunity to visually inspect various sections of proposed road corridors, convey any concerns, and discuss various survey methodologies such as wetlands and potential listed species. In addition, numerous field and office meetings, email correspondences, and phone conversations have occurred since this project was initiated in 2006 with regards to natural resource assessments and analysis techniques. In addition, dispute resolution issues regarding several natural resource topics resulted in the drafting and subsequent approval of multiple Issue Agreement Plans: Coastal and Marine Action Plan, ICE Action Plan, Wetlands Action Plan, and Wildlife and Habitat Action Plan. Elements of each plan were incorporated into supporting resource assessments that culminated in various technical documents, e.g., ESBAR, WER, in support of the PD&E and National Environmental Policy Act (NEPA) processes. Agency coordination is summarized in the table below.

Table 11.1: Summary of Gulf Coast Parkway Agency Correspondence

Date	Agency	Type of Correspondence	Attendees/Email Recipients
2/2/2007	USFWS	Email correspondence concerning Guidelines for Conducting and Reporting the results of Botanical Surveys.	Mary Mittiga, USFWS
4/23/2007	USFWS	Email correspondence to set up field review meeting.	Mary Mittiga, USFWS
5/1/2007	USFWS	Field meeting to review proposed GCP corridors.	Patty Kelly, Mary Mittiga, Vivian Negron-Ortiz, USFWS
5/2007	Multiple Agencies	Wetlands Field Evaluation Methodology Consultation. Email correspondence was sent between the above agencies and FDOT to discuss the proposed wetland evaluation methods for the PD&E study. Revisions and suggestions were shared by the agencies and a methodology was determined.	Mary Mittiga, USFWS; Ted Hoehn, FWS; Andy Phillips, USACE
5/14/2007	USFWS	Email correspondence regarding listed plant species information.	Patty Kelly & Mary Mittiga, USFWS
7/24/2007	FFWCC	Meeting to discuss State species concerns.	Scott Sanders, Ted Hoehn, Terry Gilbert, Ernest Ladkani, Greg Vaughn, Eric Schneider
8/28/2007	Multiple Agencies	Meeting to discuss Draft Issue Agreement Plan.	ETAT
8/29/2007	FFWCC	Email correspondence concerning location data for PCC.	John Hines, FFWCC
8/2007 and 9/20/2007	NMFS and FFWCC	Multiple email messages regarding EFH survey methods, modifications to survey methods due to field conditions, and final approval of survey methods.	David Rydene, NMFS; Lisa Gregg, FFWCC; Ted Hoehn, FFWCC
9/20/2007	FFWCC	Email request for black bear data in Bay and Gulf Counties and/or Northwest Florida in general (Bear Roadkill, Bear Telemetry, Nuisance Bear and Bear Range). Also requested two reports: Closing the Gaps (latest edition), Integrated Habitat Ranking System.	FFWCC
10/9/2007	USFWS	Email correspondence about FWS assessment methods and comments on assessment method approach.	Hildreth Cooper, USFWS
11/7/2007	Multiple Agencies	Email correspondence concerning PCC field meeting focused on species identification and draft mitigation options.	David Cook, FFWCC

Date	Agency	Type of Correspondence	Attendees/Email Recipients
11/29/2007	USACE	Follow-up to USACE inquiring about coordination with the NMFS on EFH.	Andy Phillips, USACE
12/8/2009	FFWCC	Email correspondence listing wildlife species of potential concern, potential indirect impacts, and generalized mitigation objectives and goals.	Terry Gilbert, FFWCC
12/8/2009	NMFS	Email correspondence concerning EFH indirect impact analysis related to alignment buffers.	David Rydene, NMFS
12/9/2009	Multiple Agencies	Email and phone correspondence about buffer widths associated with indirect impact assessments concerning T&E species and EFH.	Ted Hoehn, FFWCC, David Rydene, NMFS; Mary Mittiga, USFWS, Terry Gilbert, FFWCC
12/18/2009	FFWCC	PCC data/assessment methods	John Himes, FFWCC
4/20/2011	Multiple Agencies	Letters and documents sent to individual agency representatives requesting their review of ESBAR, WER, ICE report, and Draft EIS.	Ted Hoehn, FFWCC, David Rydene, NMFS; Mary Mittiga, USFWS, Terry Gilbert, FFWCC; Andy Phillips and Randy Turner, USACE; Duncan Cairns, NFWFMD
5/18/2011	USFWS	Comment letter regarding draft ESBAR and species concurrence assessments. (Appendix C)	Don Imm, USFWS
5/25/2011	NMFS	Comment letter regarding Draft EIS. (Appendix C)	David Rydene, NMFS
6/1/2011	USFWS	Comment letter regarding draft WER, ICE Report, and Draft EIS (Appendix C)	Don Imm, USFWS
6/13/2011	FFWCC	Comment letter regarding ICE report. (Appendix C)	Scott Sanders, FFWCC
6/24/2011	NFWFMD	Comment letter regarding Draft EIS. (Appendix C)	Duncan Cairns, NFWFMD
7/15/2011	USACE	Comment letter concerning WER, ICE report, and Draft EIS. (Appendix C)	Randy Turner, USACE

SECTION 12 REFERENCES

Baker, W. W. 1978. Red-cockaded Woodpecker. Pages 11-13 in H. W. Kale II, ed. Rare and endangered biota of Florida. Vol. 2: Birds. Univ. Presses of Florida, Gainesville.

Conant, R., Collins. 1998. Reptiles and Amphibians of Eastern Central North America. NY: Houghton Mifflin Co.

Fisk, E. J. 1978. Roof-nesting terns, skimmers, and plovers in Florida. Fla. Field Nat. Chapter 6:1-8.

Florida Administrative Weekly & Florida Administrative Code, Notice # 4795600, Website: <http://www.flrules.org/gateway/ruleno.asp?id=68A-27.005&Section=0>,

Florida Fish and Wildlife Conservation Commission, Freshwater Fish and Wildlife, Rules Relating to Endangered or Threatened Species, Rule: 68A-27.005 Designation of Species of Special Concern; Prohibitions, Permits.

Florida Fish and Wildlife Conservation Commission. January 2003. Florida's breeding bird atlas: A collaborative study of Florida's birdlife. <http://www.myfwc.com/bba/> (Date accessed 9/29/2007).

Florida Fish and Wildlife Conservation Commission. 2007. Draft Management Plan, Panama City Crayfish, *Procambrus econfinae*. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida.

Florida Fish and Wildlife Conservation Commission, US Fish and Wildlife Service, Florida Natural Areas Inventory. Florida Wildlife Conservation Guide. Tallahassee; Version July 2009 (annual update).

http://myfwc.com/CONSERVATION/fwcg/index_files/textonly/slide1.html

Florida Natural Areas Inventory and The Nature Conservancy 2001. Rare Plant Conservation through Private Action: Final Report to USFWS (agreement 1448-40181-98-J-016).

Florida Plant Atlas Database website: <http://florida.plantatlas.usf.edu/Default.aspx>

Franz, R. and Smith, L., *Distribution and Status of the Striped Newt and Florida Gopher Frog in Peninsular Florida*. December 1999. Florida Fish and Wildlife Conservation Commission, Project #NG90-035.

Gopher Tortoise Council website. <http://www.gophertortoisecouncil.org/about.php>. 2007.

Gopher Tortoise Council c/o Florida Museum of Natural History, P.O. Box 117800, University of Florida, Gainesville, FL 32611.

Gore, J. A. 1991. Distribution and abundance of nesting Least Terns and Black Skimmers in northwest Florida. Fla. Field Nat. 19:65-72.

Guidelines from the Florida Natural Areas Inventory <http://www.fnai.org/index.cfm>

Hallum, C., Wheaton, K., Fischer, R. March 1998. *Species Profile: Eastern Indigo Snake (Drymarchon corais couperi) on Military Installations in the Southeastern United States*. Technical Report SERDP-98-2, USACE.

Hipes, D., D.R. Jackson, K. NeSmith, D. Printiss, and K. Brandt. 2000. *Field Guide to the Rare Animals of Florida*. Florida Natural areas Inventory, Tallahassee, FL.

Hobbs, H.H. Jr. 1942. The crayfishes of Florida. University of Florida Press, Biological Series 3(2):v-179.

Jackson, J.A. 1994. Red-cockaded Woodpecker (*Picoides borealis*). In A. Poole and F. Gill, eds. *The birds of North America*, No. 85. Acad. Nat. Sci., Philadelphia, Pa. and Am. Ornithol. Union, Washington, D.C.

Kale, H. W., II, B. Pranty, B. M. Stith, and C. W. Biggs. 1992. *The atlas of the breeding birds of Florida*. Final Report. Florida Game and Fresh Water Fish Commission, Tallahassee, Florida.

Keppner, E.J. and L.A. Keppner. 2001 A survey and conservation status of the Panama City crayfish. June 2001. Submitted to the Bay Environmental Study Team, Inc. and U.S. Fish and Wildlife Service, Panama City, Florida.

Keppner, E.J. and L.A. Keppner. 2004 A summary of the Panama City crayfish, *Procambrus econfinae* Hobbs, 1942. October 2004. Submitted to the U.S. Fish and Wildlife Service, Panama City Field Office, Panama City, Florida.

Nelson, G. 2005. *East Gulf Coastal Plain Wildflowers; a fieldguide to the wildflowers of the East Gulf Coastal Plain including southwest Georgia, northwest Florida, southern Alabama, southern Mississippi, and parts of southeastern Louisiana*. The Globe Pequot Press, Guilford, Connecticut, 265 pages.

Petranka, J. 1998. *Salamanders of the US and Canada*. WA: Smithsonian Institution Press.
Schaefer, J. and Junkin, J. March 1999. *Eastern Indigo Snake: A Threatened Species*. University of Florida Cooperative Extension Service, Gainesville, FL.

Schaefer, J. and Sargent, M. *Florida Black Bear: A Threatened Species*. 1990. Fact Sheet SS-WIS-25, Department of Wildlife Ecology & Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida.

Seely, C. 2000. "Ambystoma cingulatum" (On-line), Animal Diversity Web. Accessed September 22, 2007 at

http://animaldiversity.ummz.umich.edu/site/accounts/information/Ambystoma_cingulatum.html.

St. Joe website. Accessed September 28, 2007:

<http://www.joe.com/web/JoeStory/ConservationByProtection/RedCockadedWoodPecker.htm>.

U.S. Department of the Interior, 2003. LBMA, BLM, Jackson, Mississippi.

U.S. Fish and Wildlife Service. 1985. Red-cockaded woodpecker recovery plan. Atlanta, Georgia.

U.S. Fish and Wildlife Service. 2003. Red-cockaded woodpecker recovery plan. Atlanta, GA.

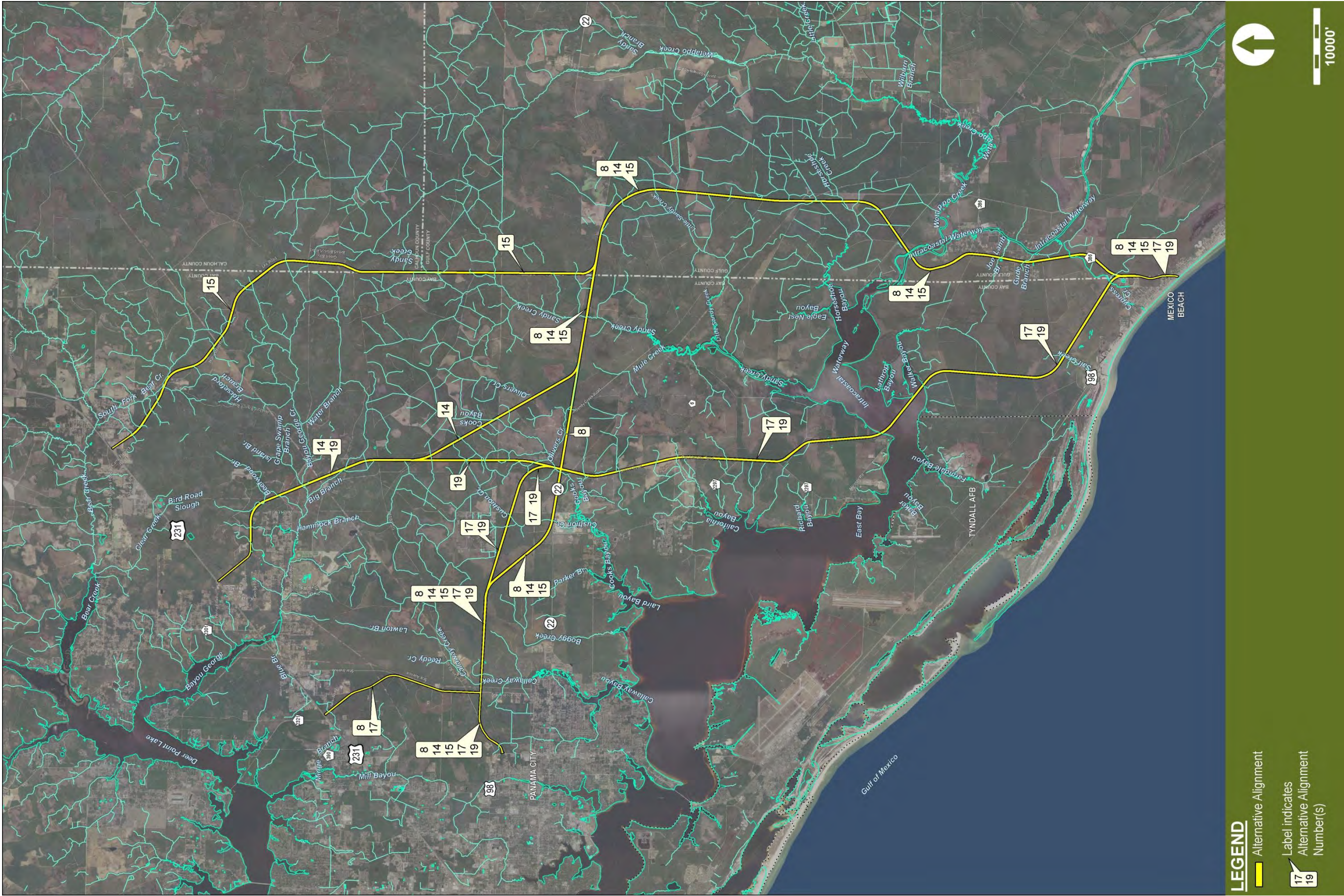
U.S. Fish and Wildlife Service. 1992. Endangered and threatened species of the southeast United States (The Red Book). Prepared by Ecological Sciences, Division of Endangered Species, Southeast region. Government Printing Office, Washington D.C.

U.S. Fish and Wildlife Service. May 2006. Guidelines for conducting and reporting botanical inventories for federally listed, proposed, and candidate plants.

APPENDIX A

FIGURES

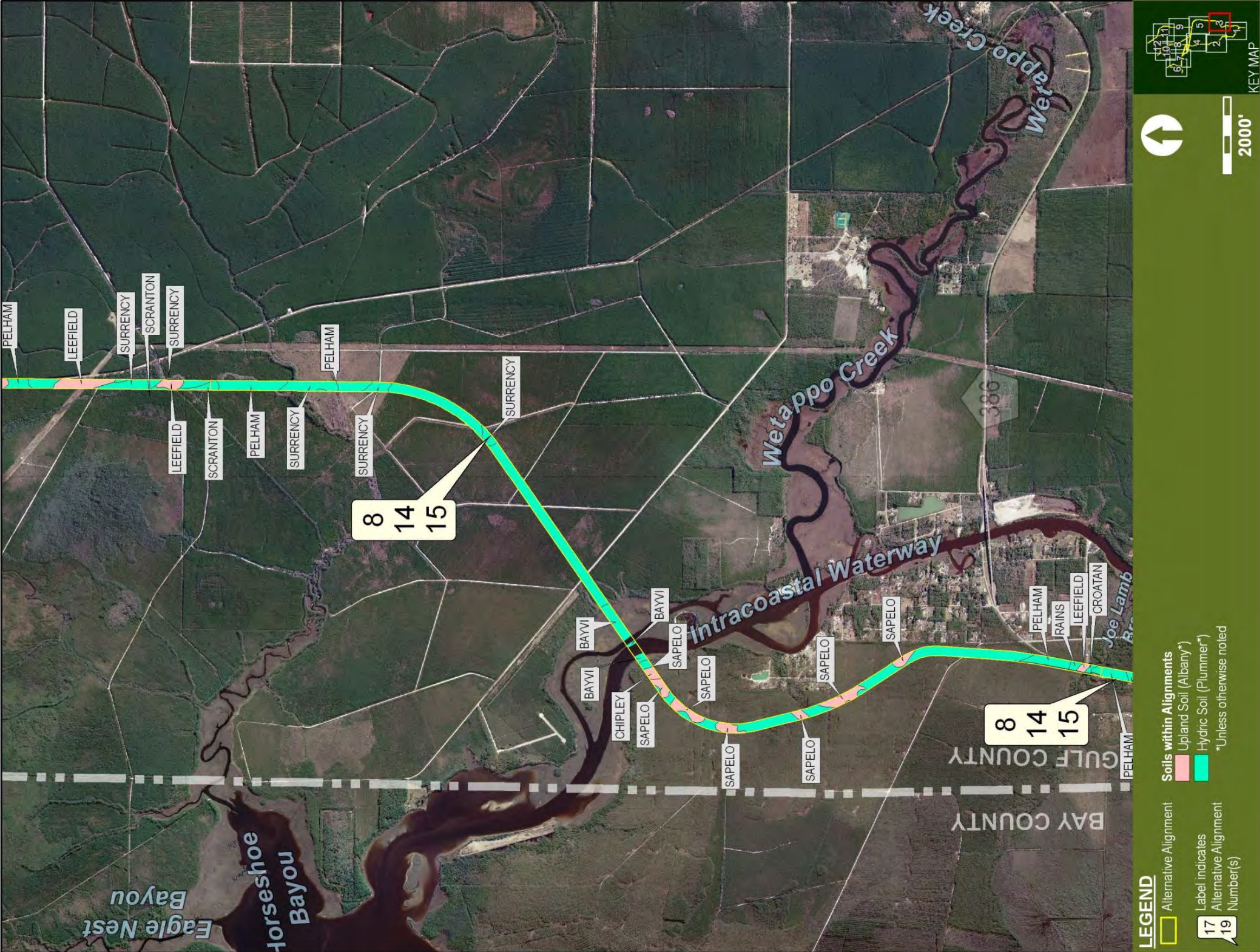
Figure 1 Named Streams



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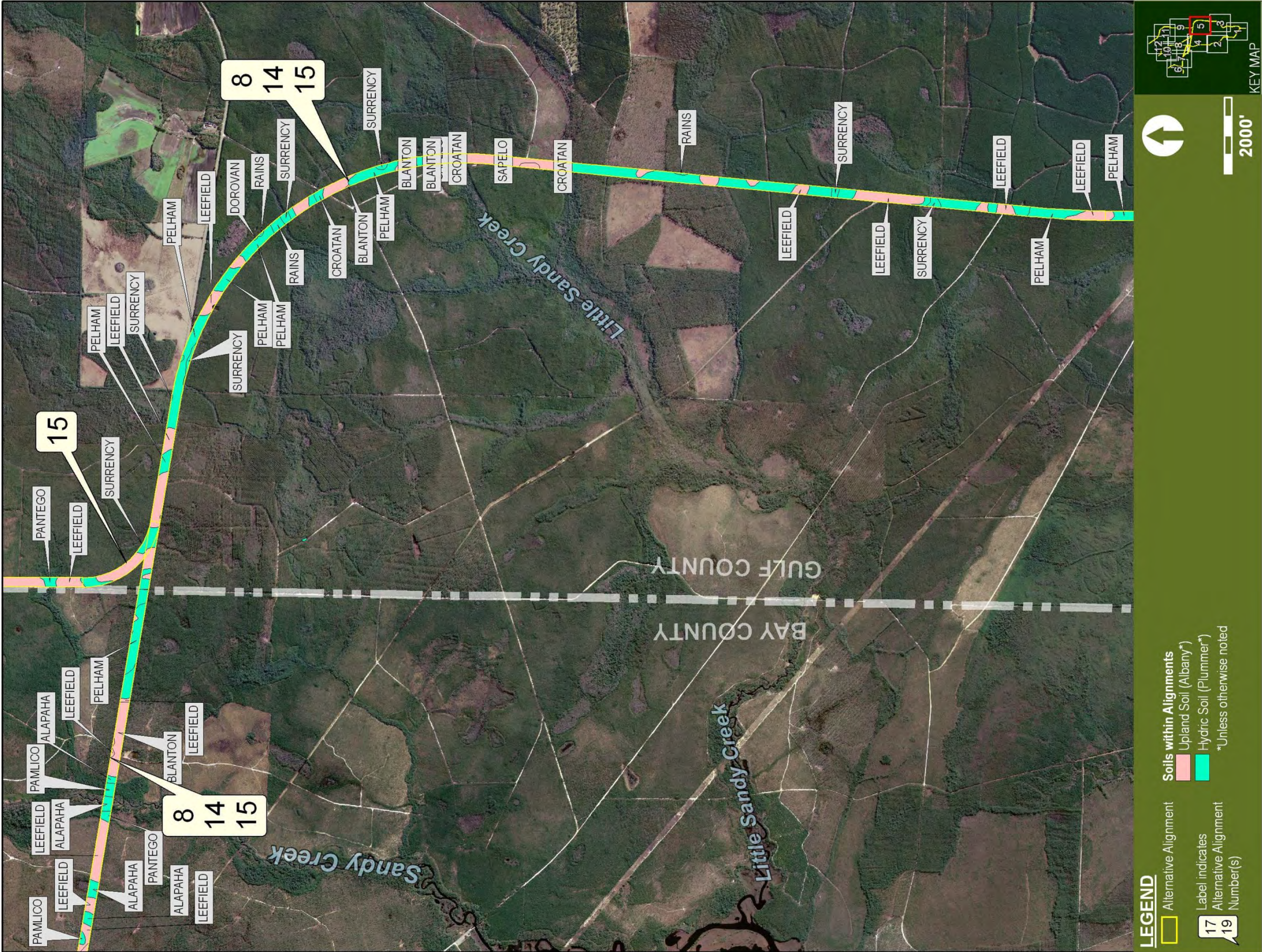
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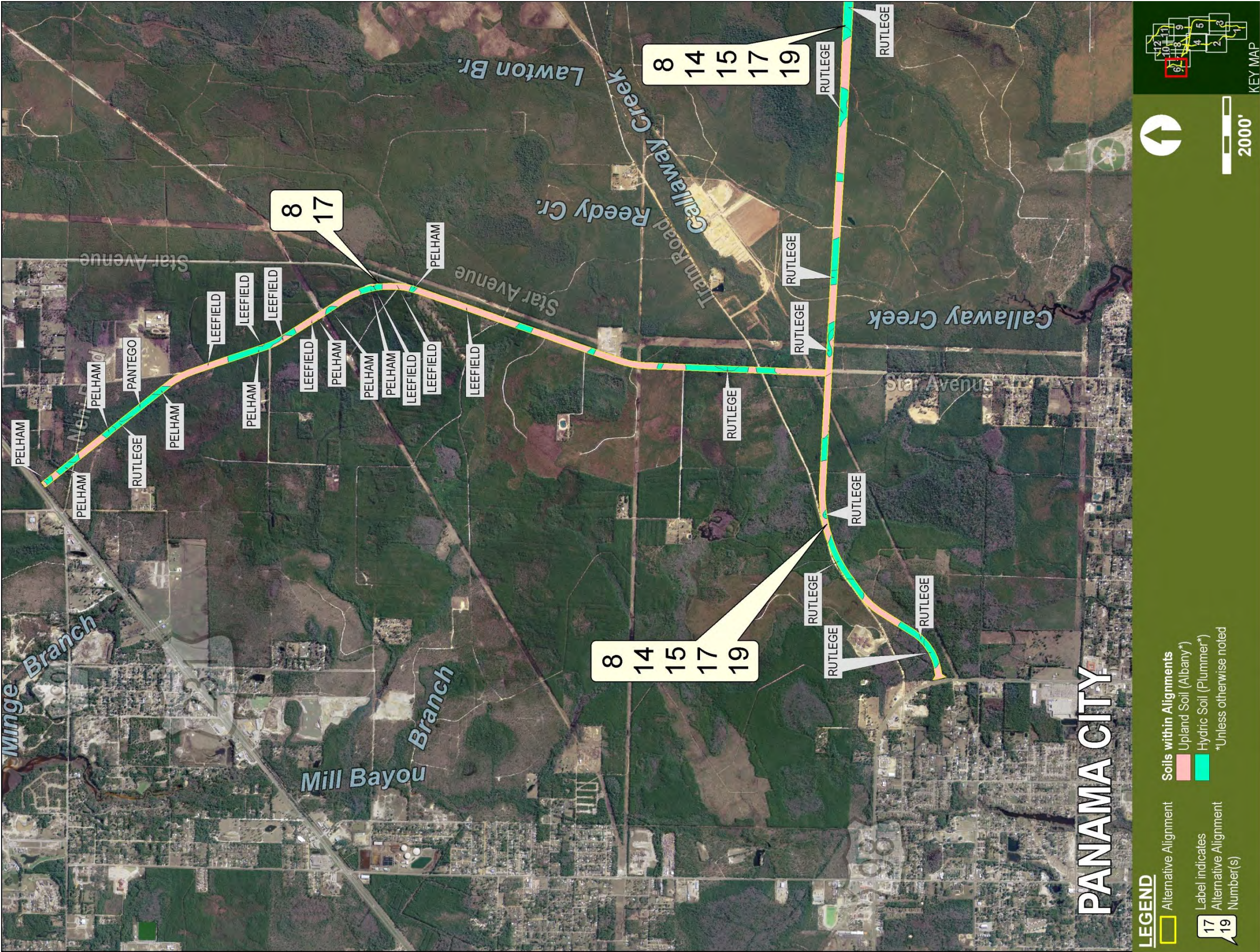
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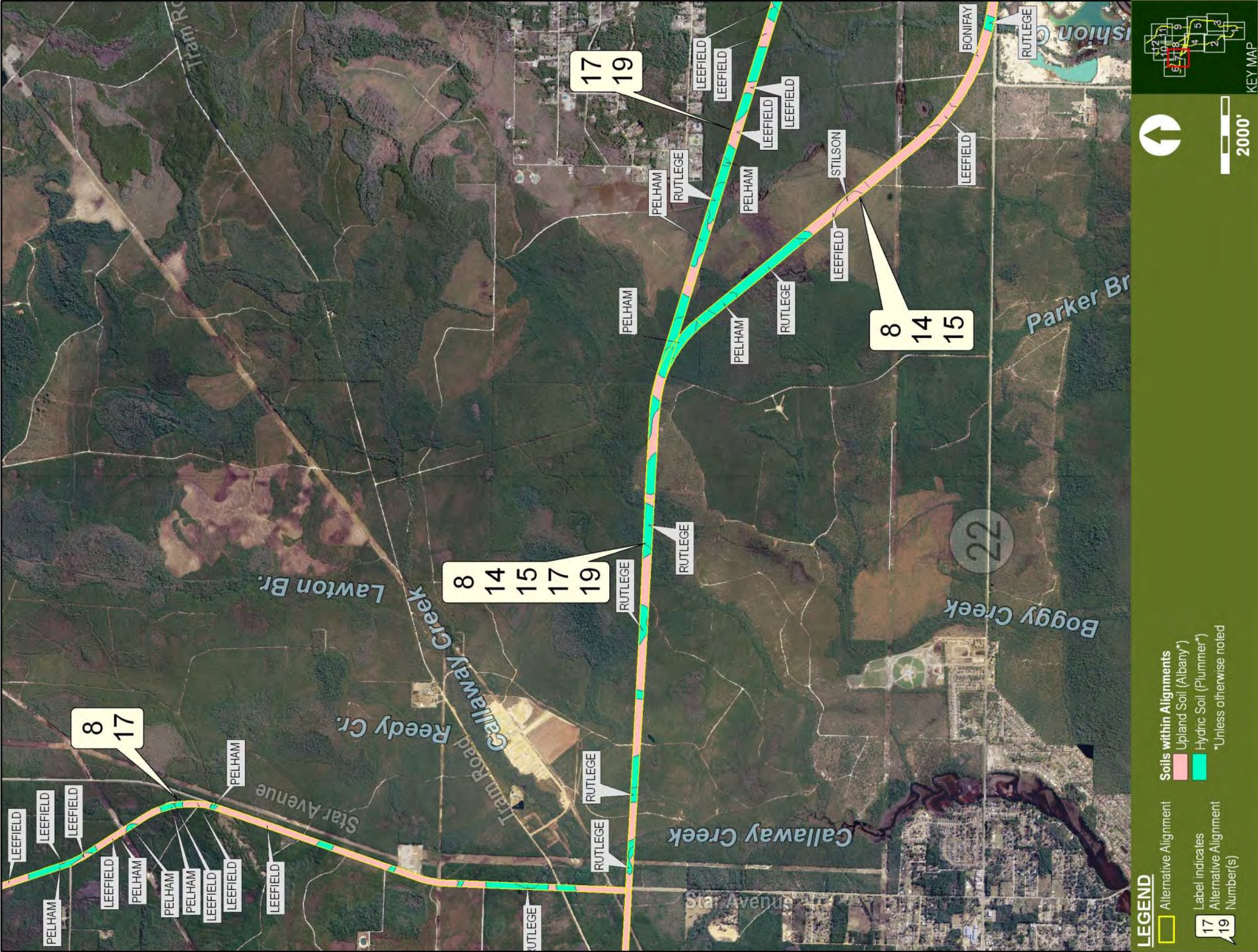
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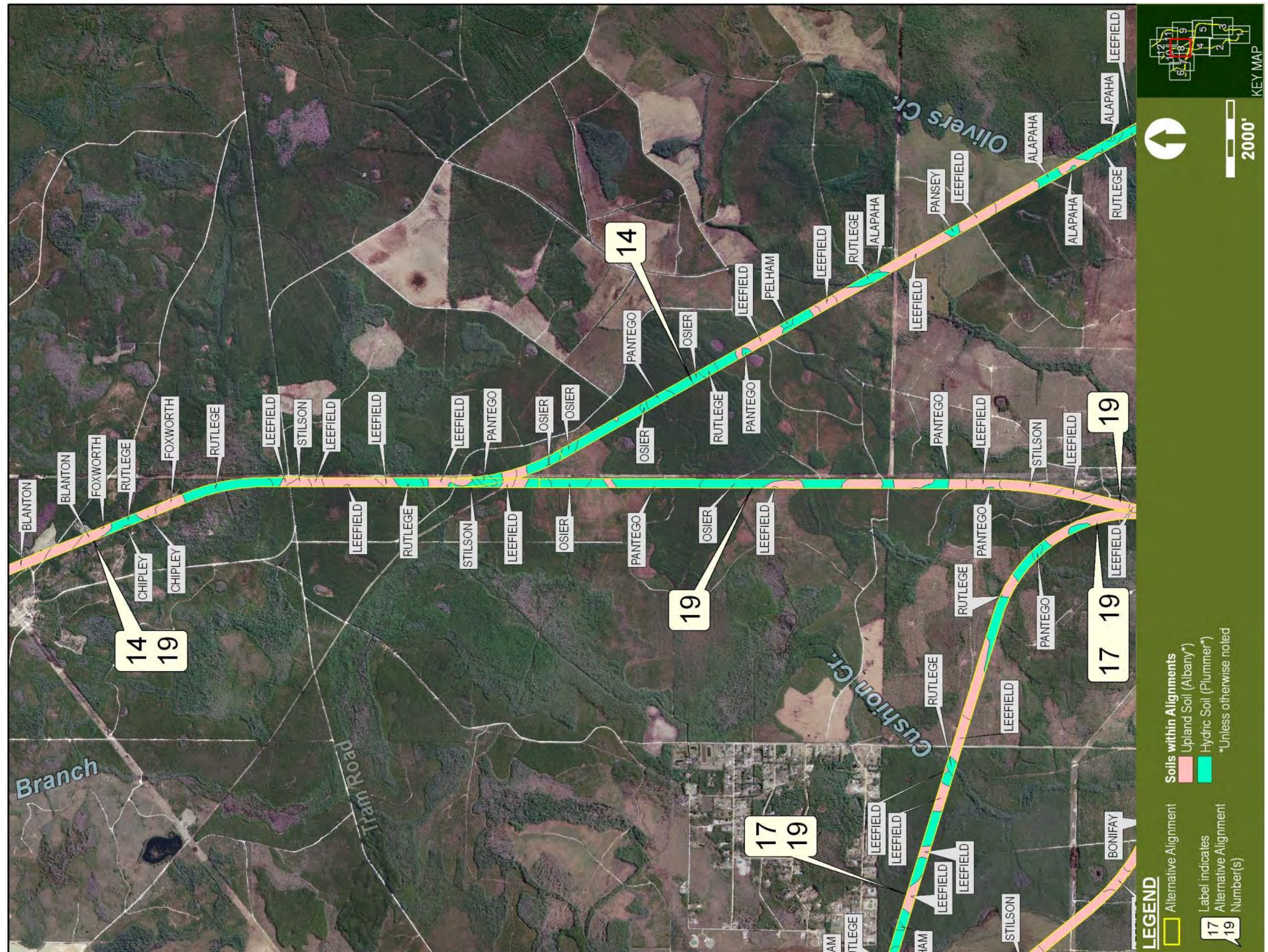
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Soils Figure 8



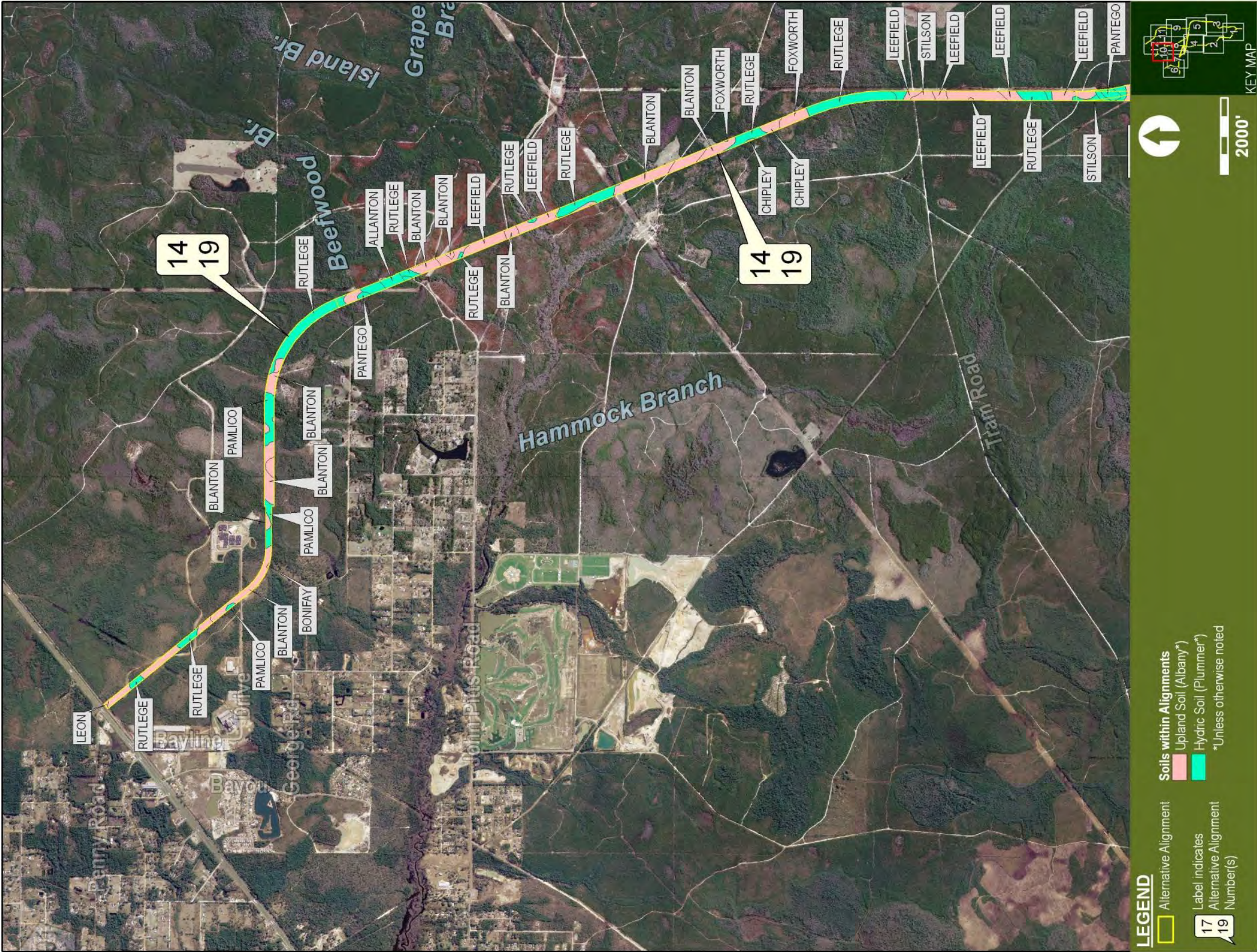
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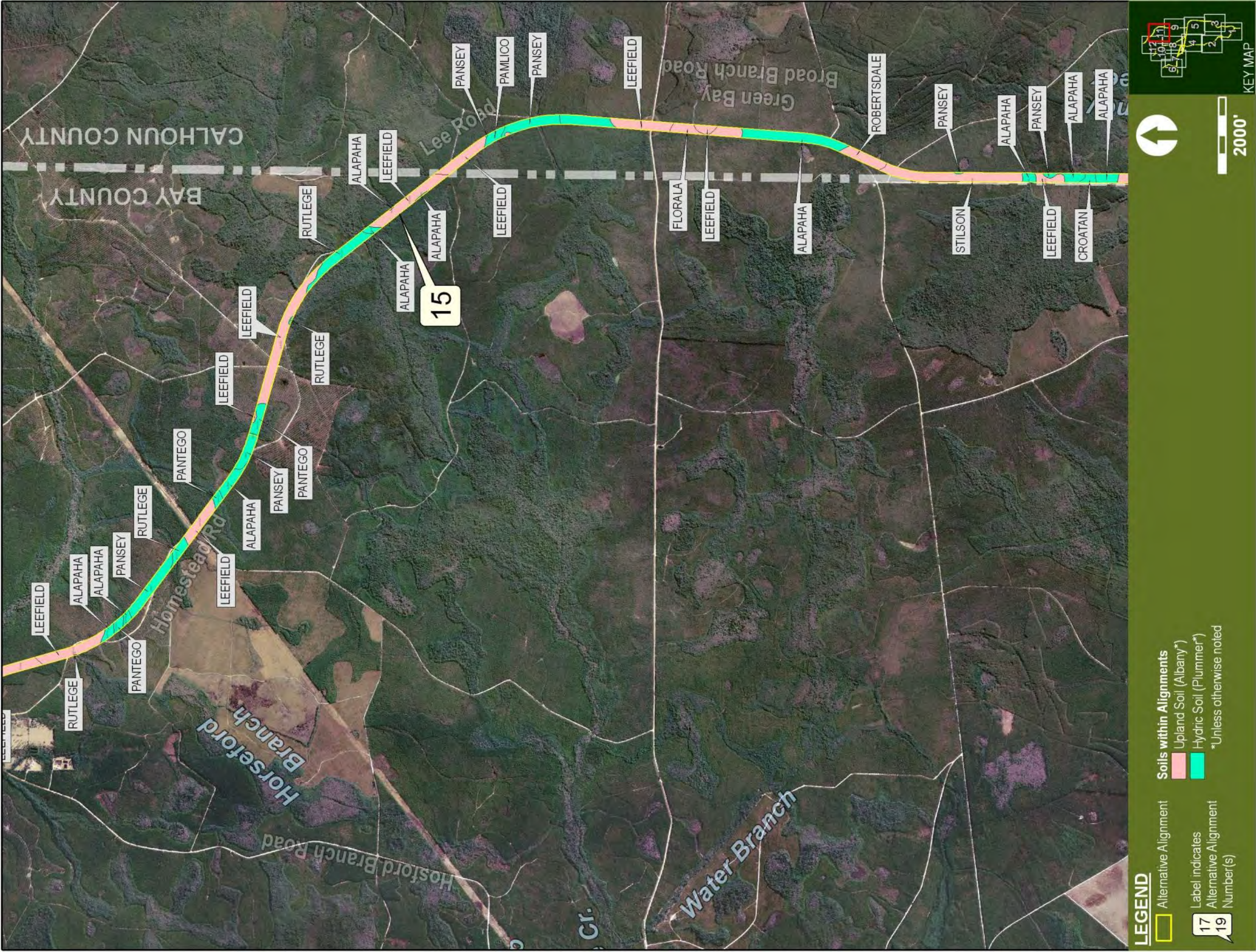
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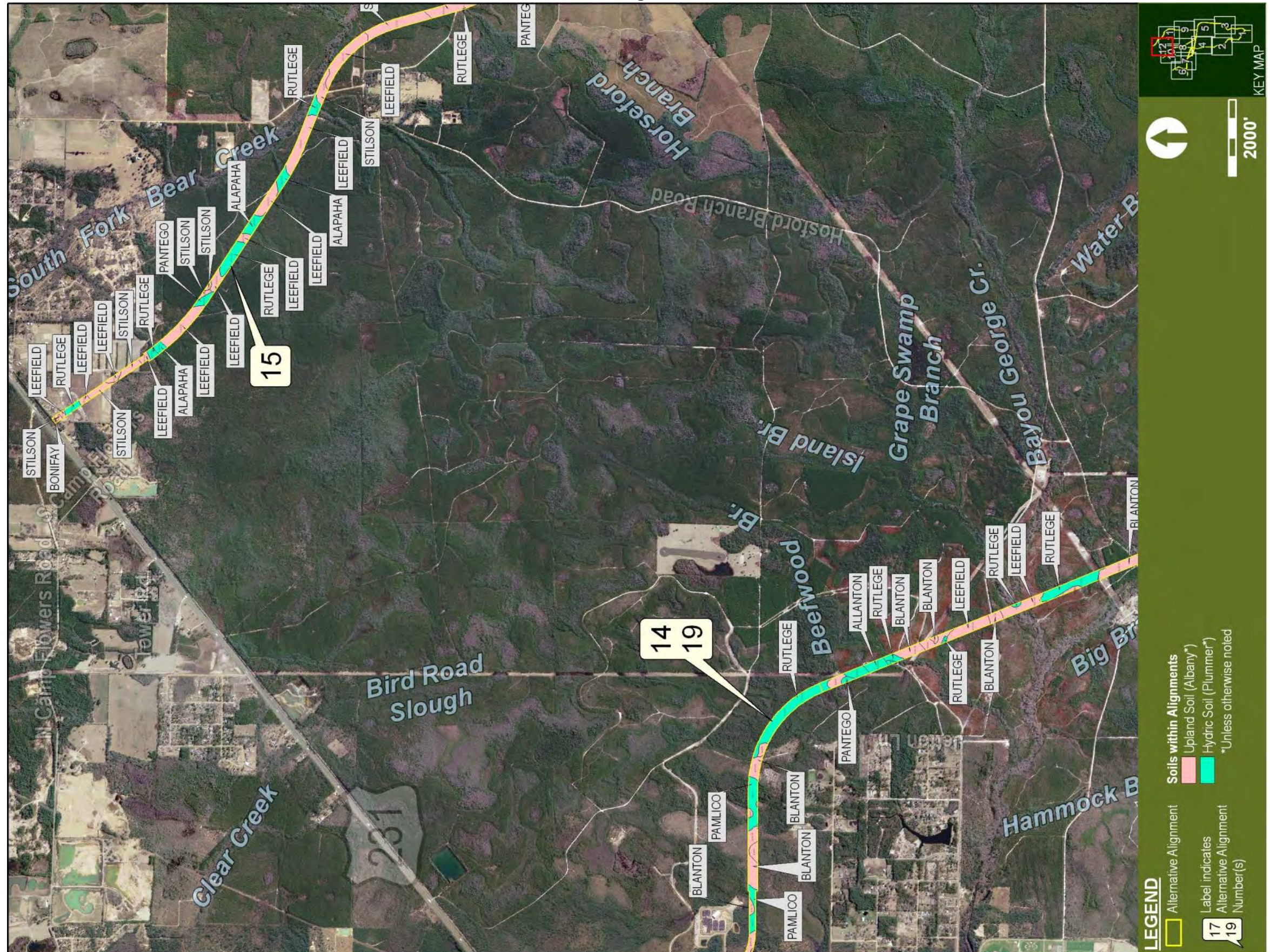
Soils Figure 11



Soils Figure 12



Soils Figure 13



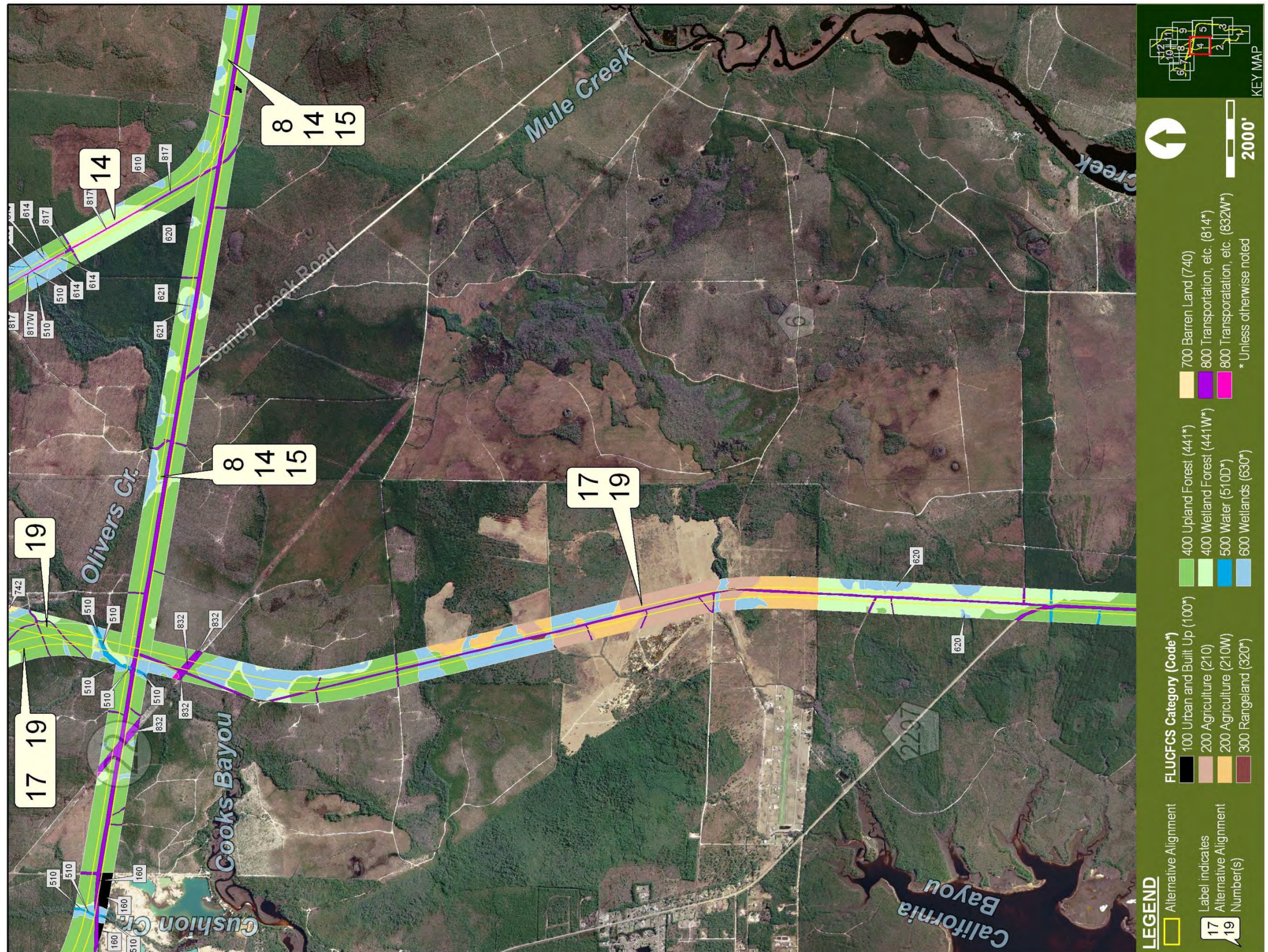


FLUCFCS Figure 15

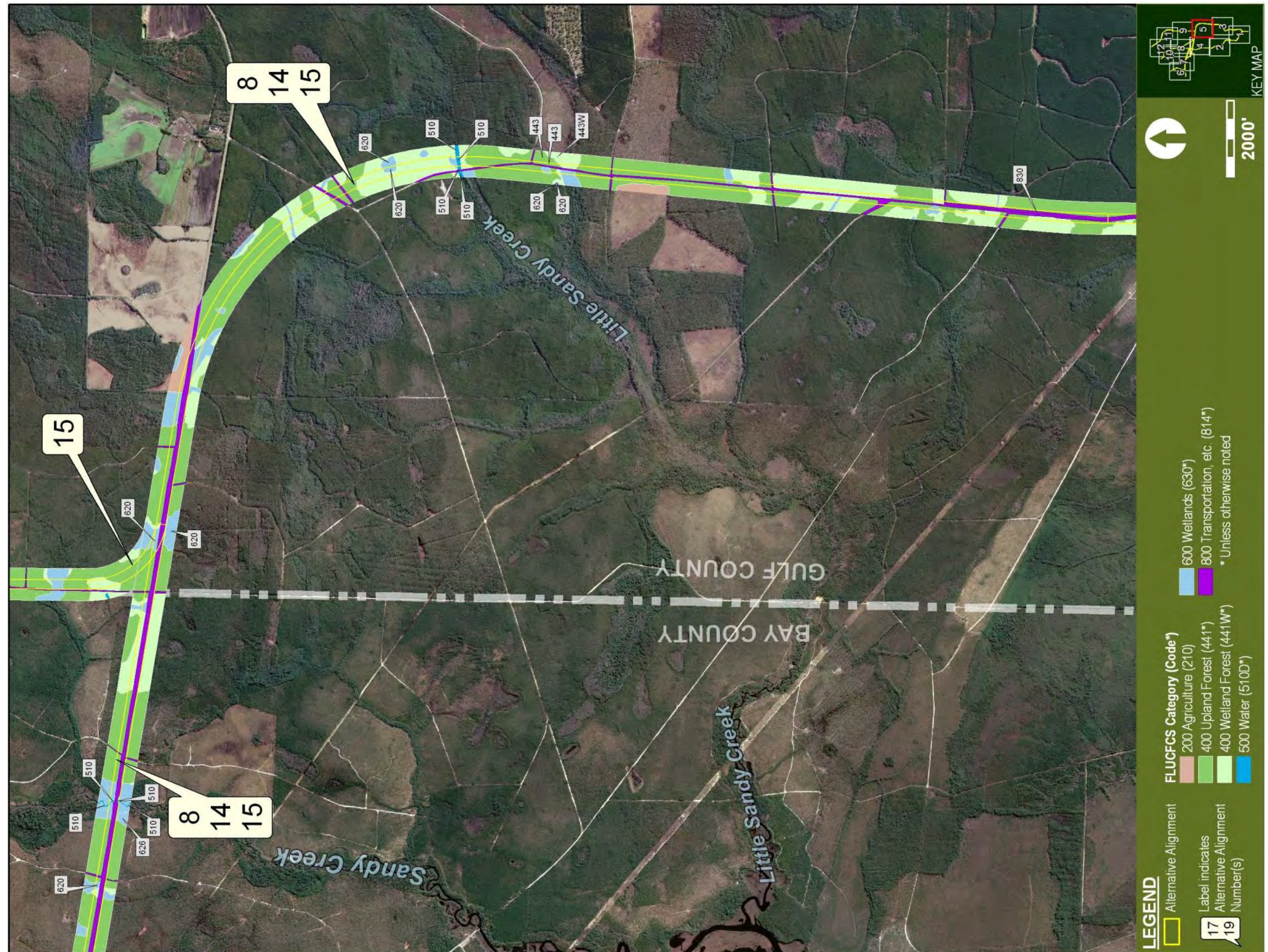




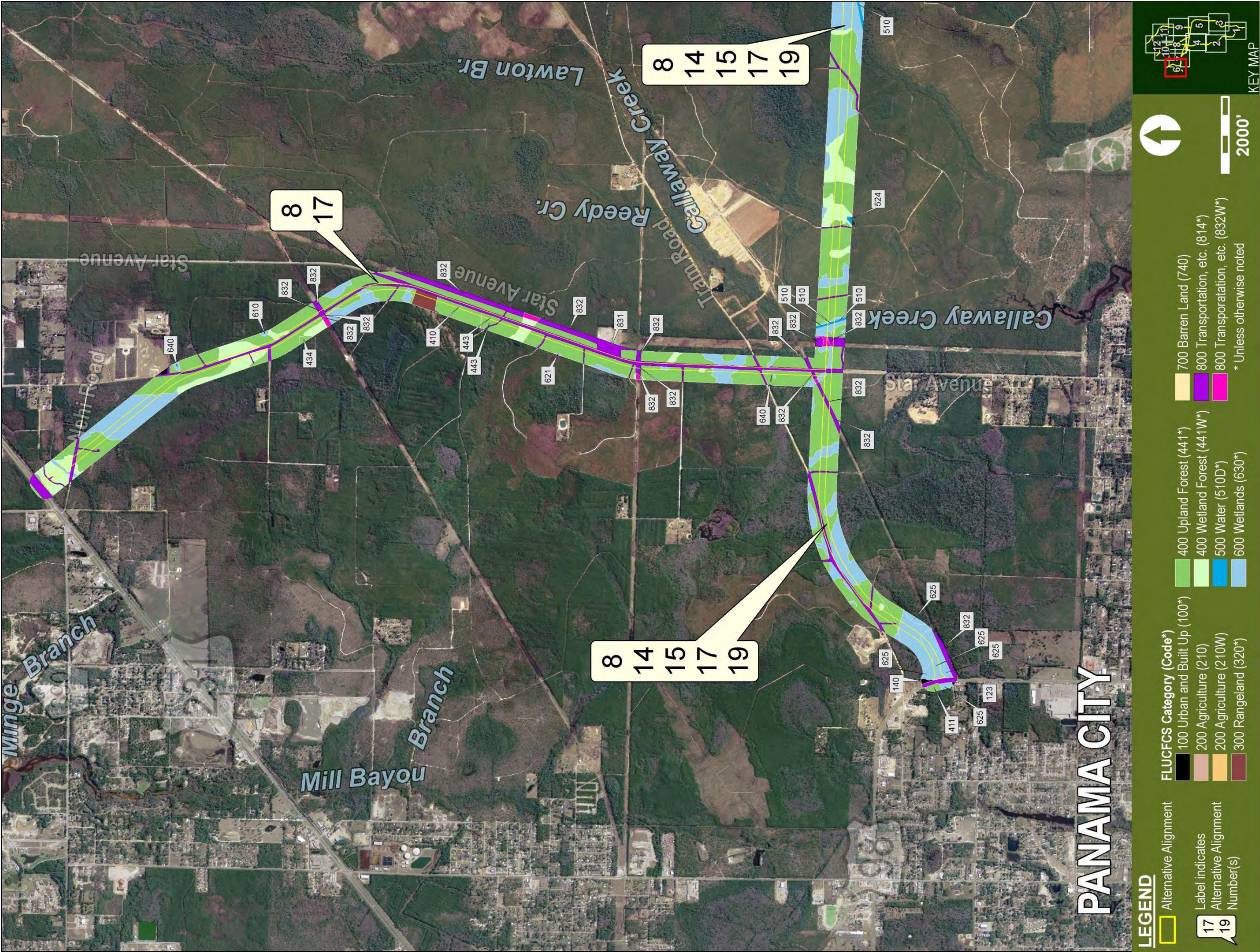
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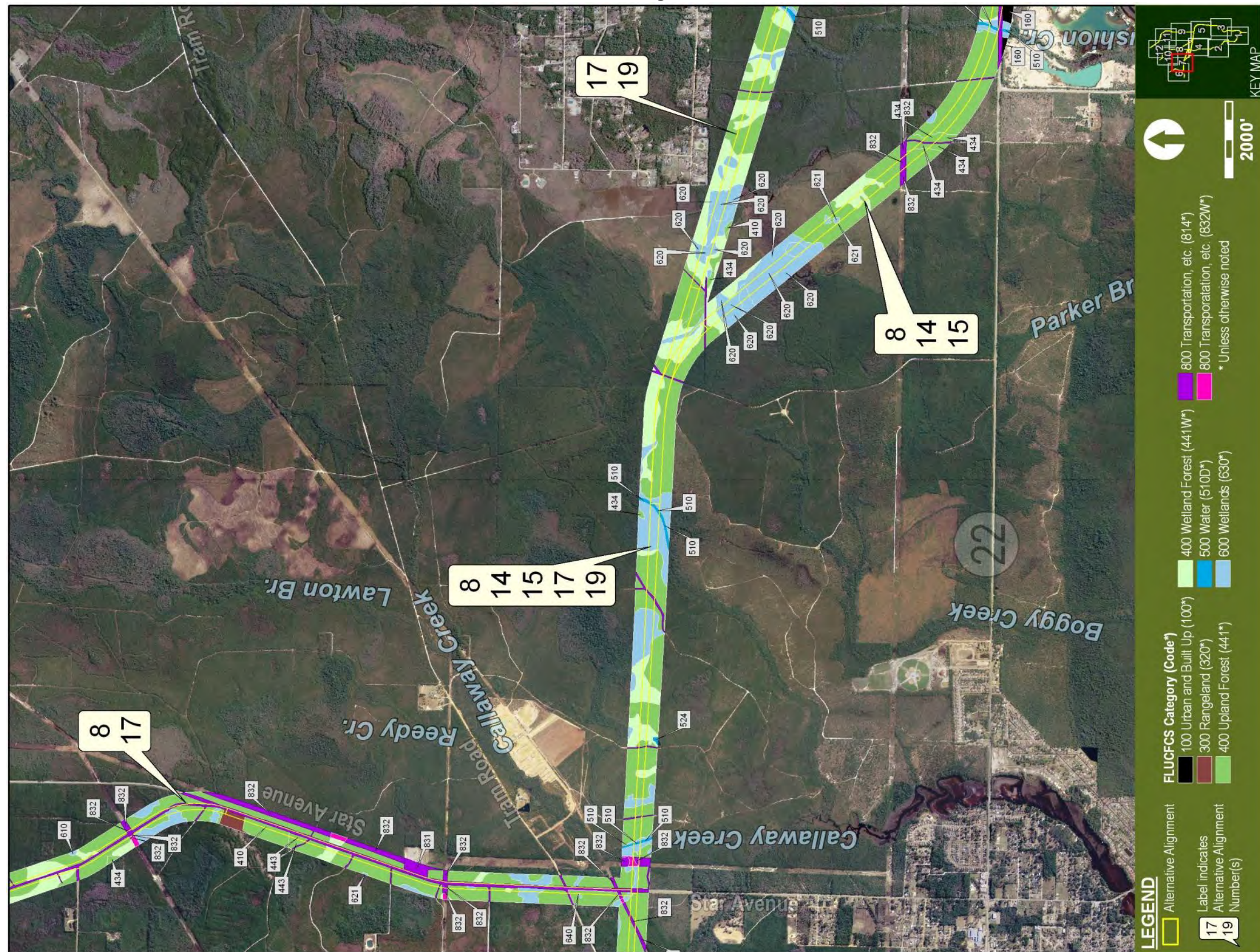
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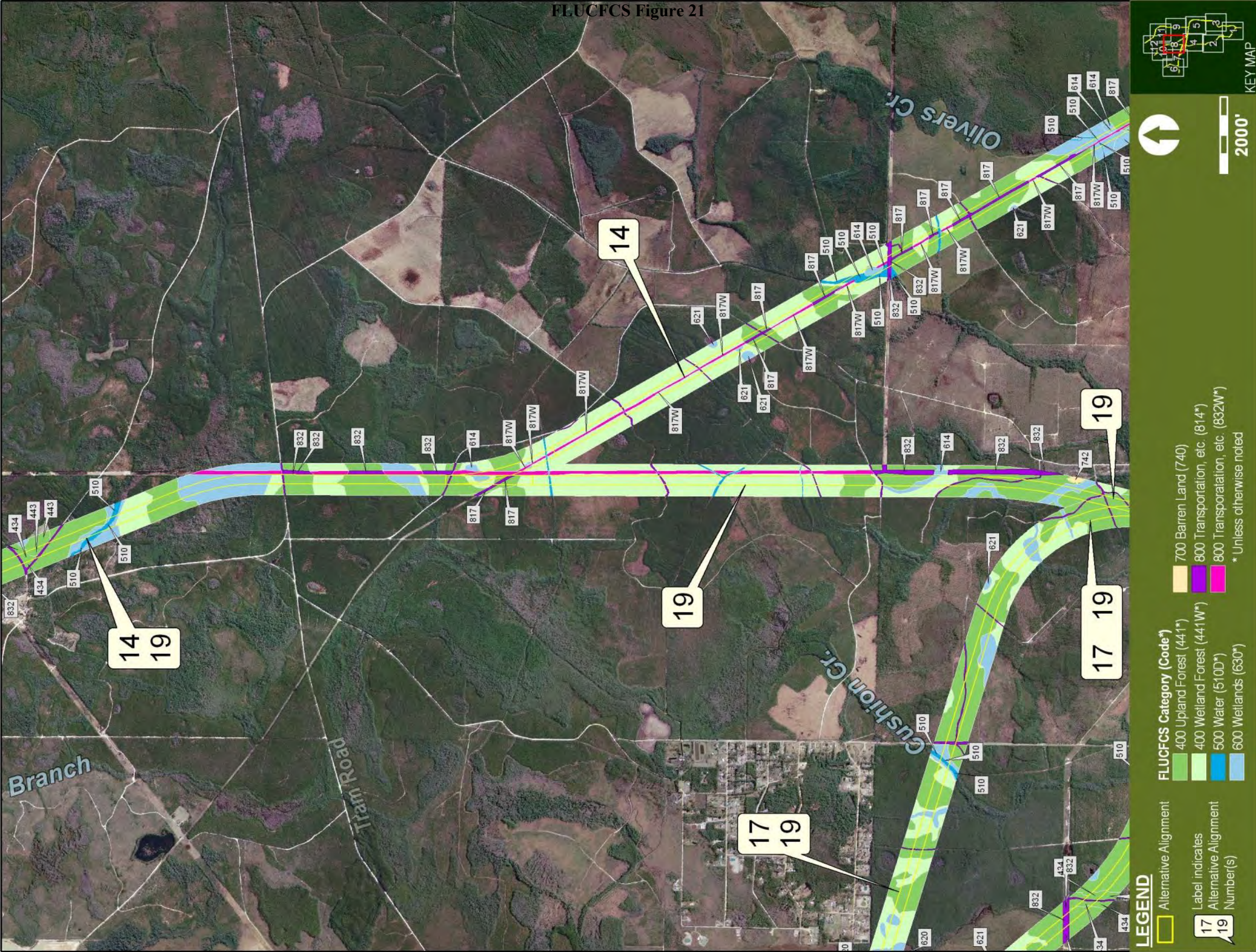


FLUCFCS Figure 19



FLUCFCS Figure 20

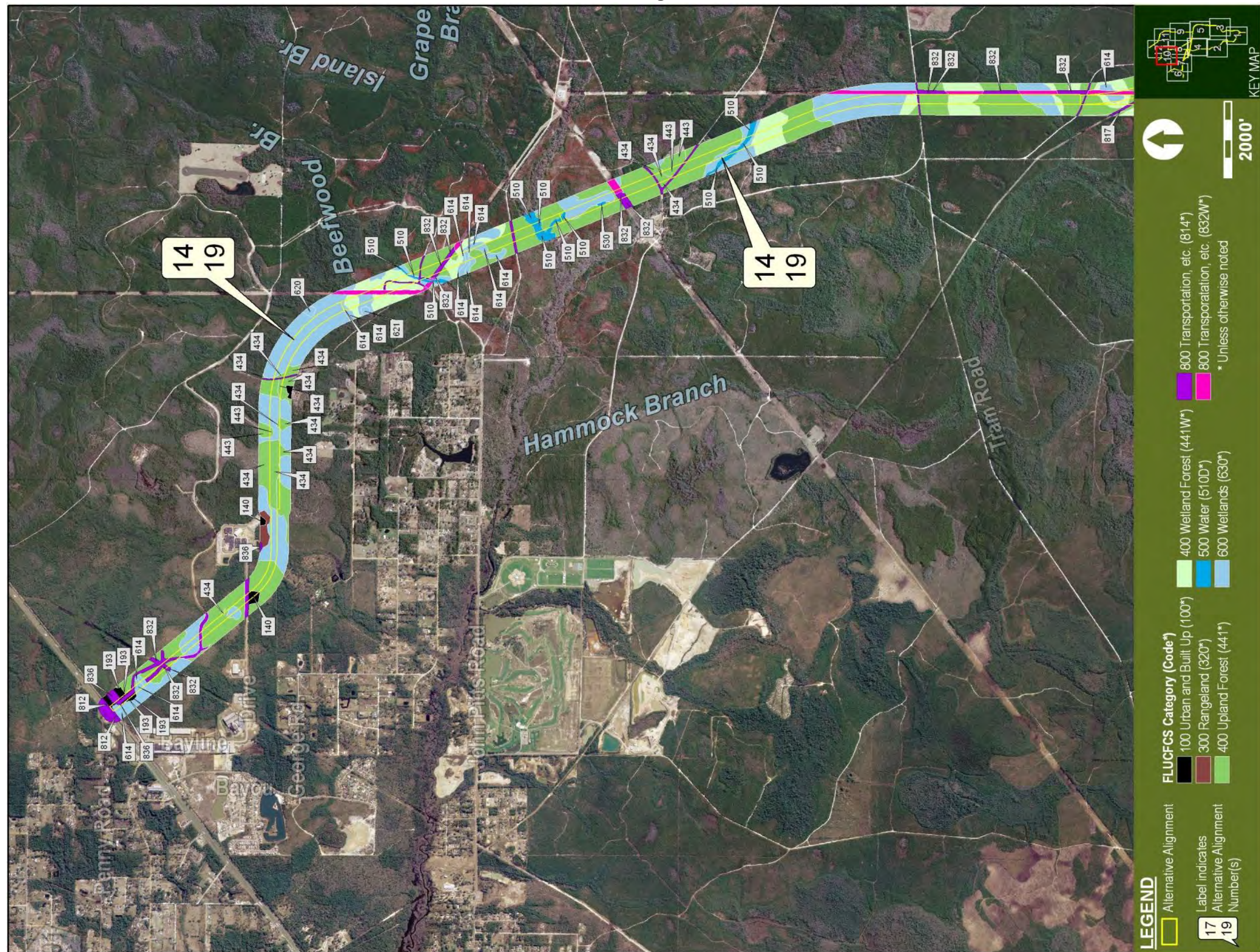




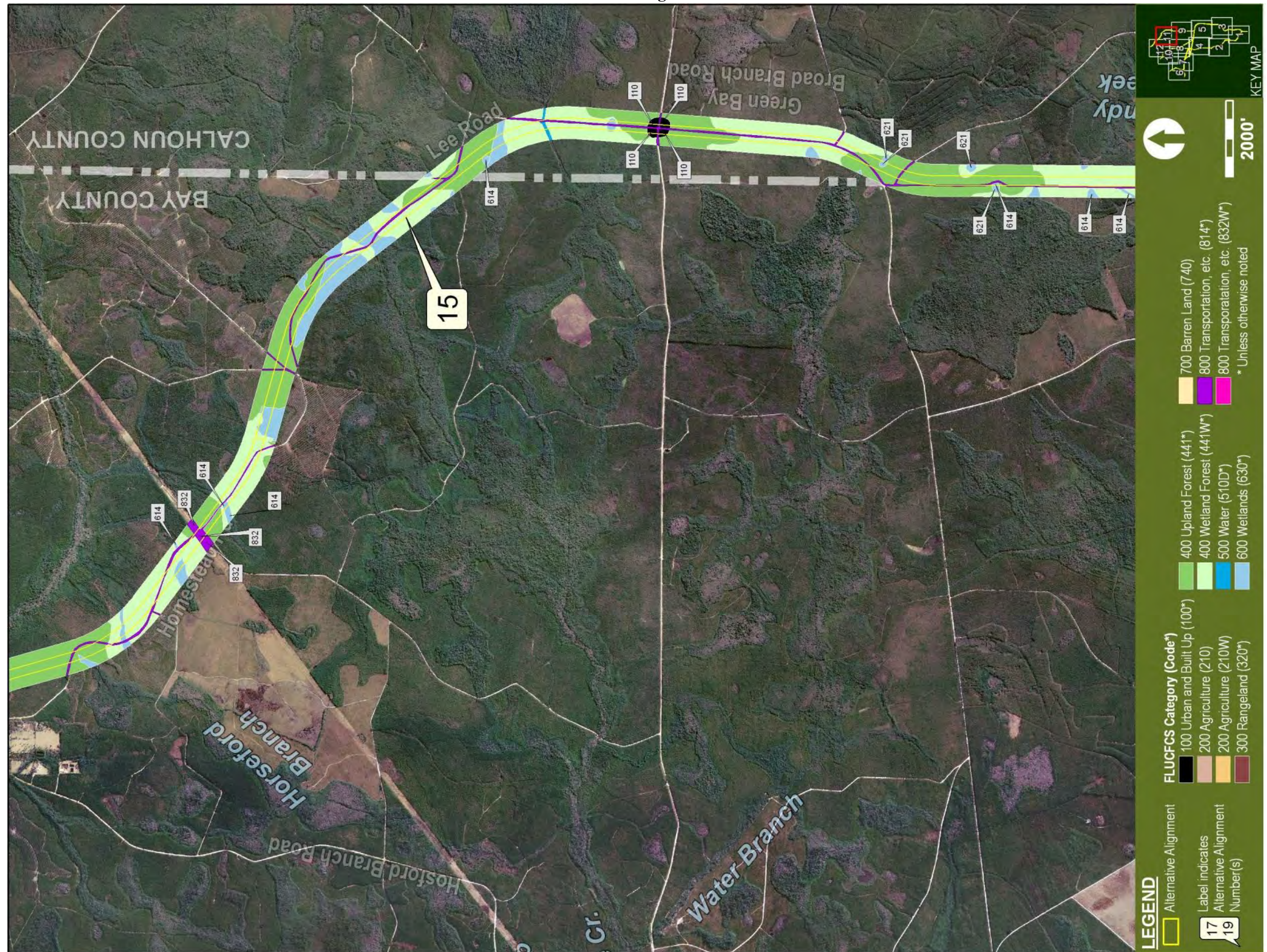
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FLUCFCS Figure 23



FLUCFCS Figure 24



FLUCFCS Figure 25

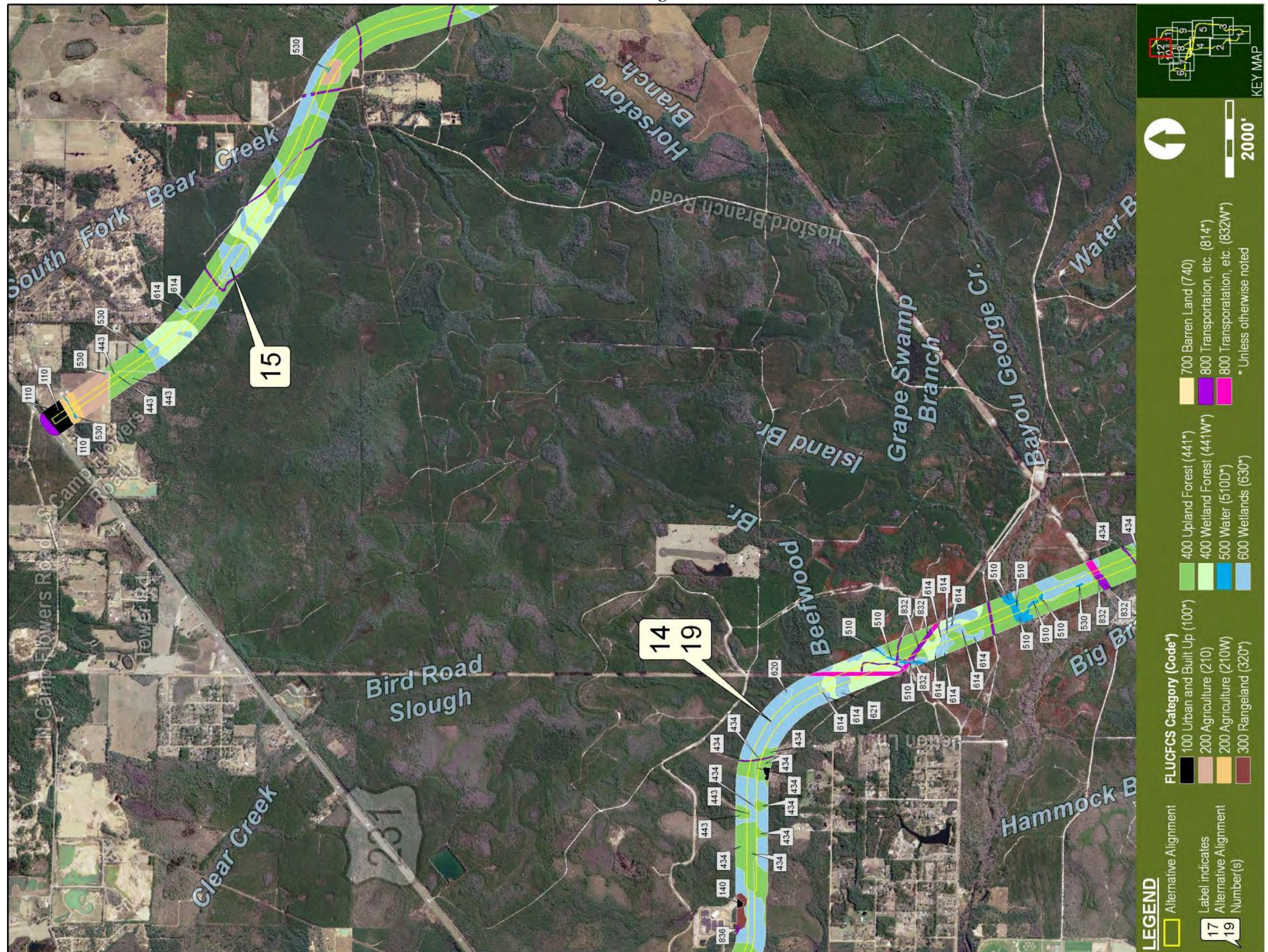


Figure 26: Gulf Sturgeon Critical Habitat





U.S. Fish and Wildlife Service

Critical Habitat for Bay County, Florida

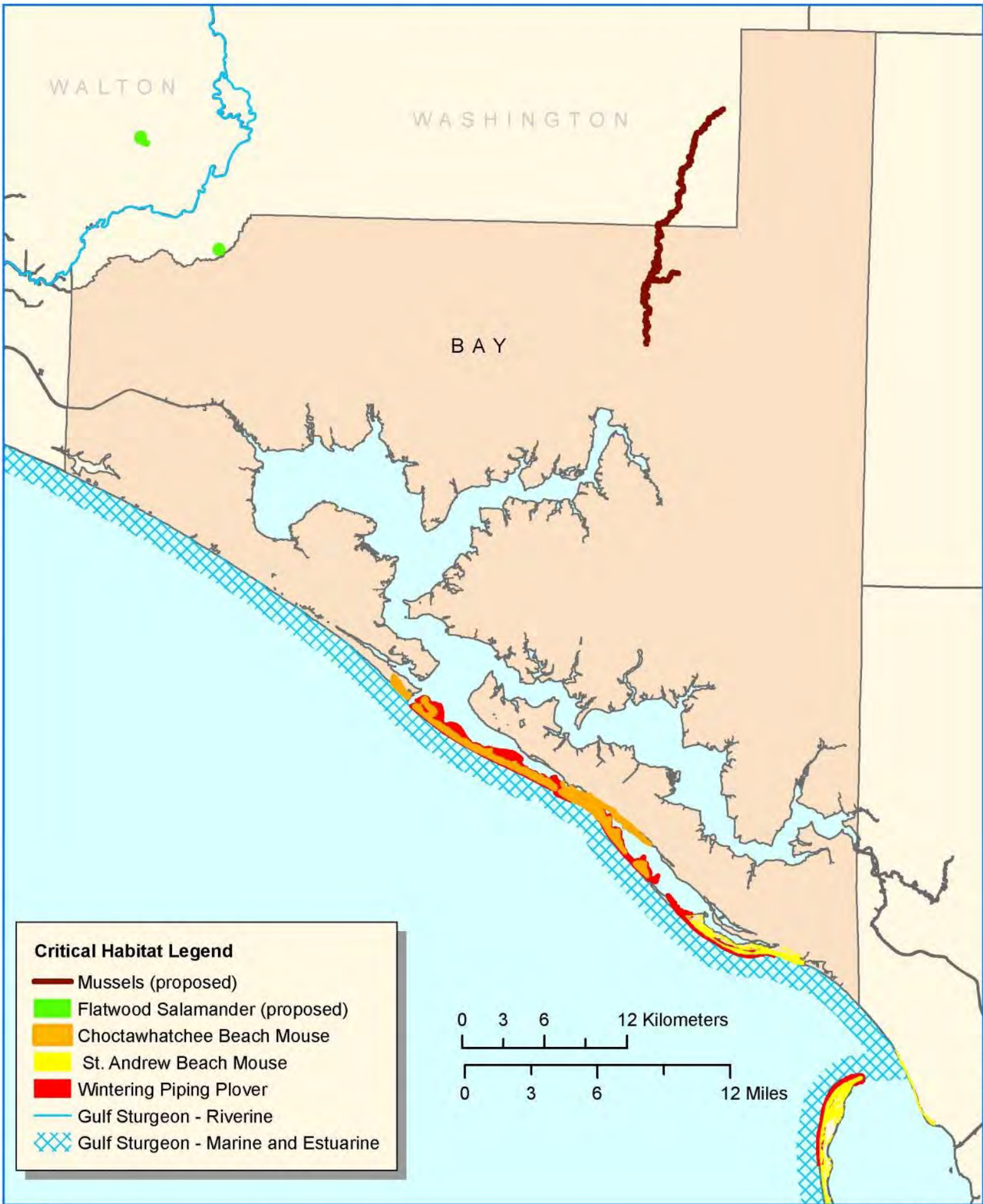


Figure 27: Critical Habitat for Bay County

This map is for illustrative purposes only, for the precise legal Critical Habitat designation please refer to Federal Register notices



U.S. Fish and Wildlife Service

Critical Habitat for Gulf County, Florida



Source: USFWS

Panama City Field Office
Marc 2006

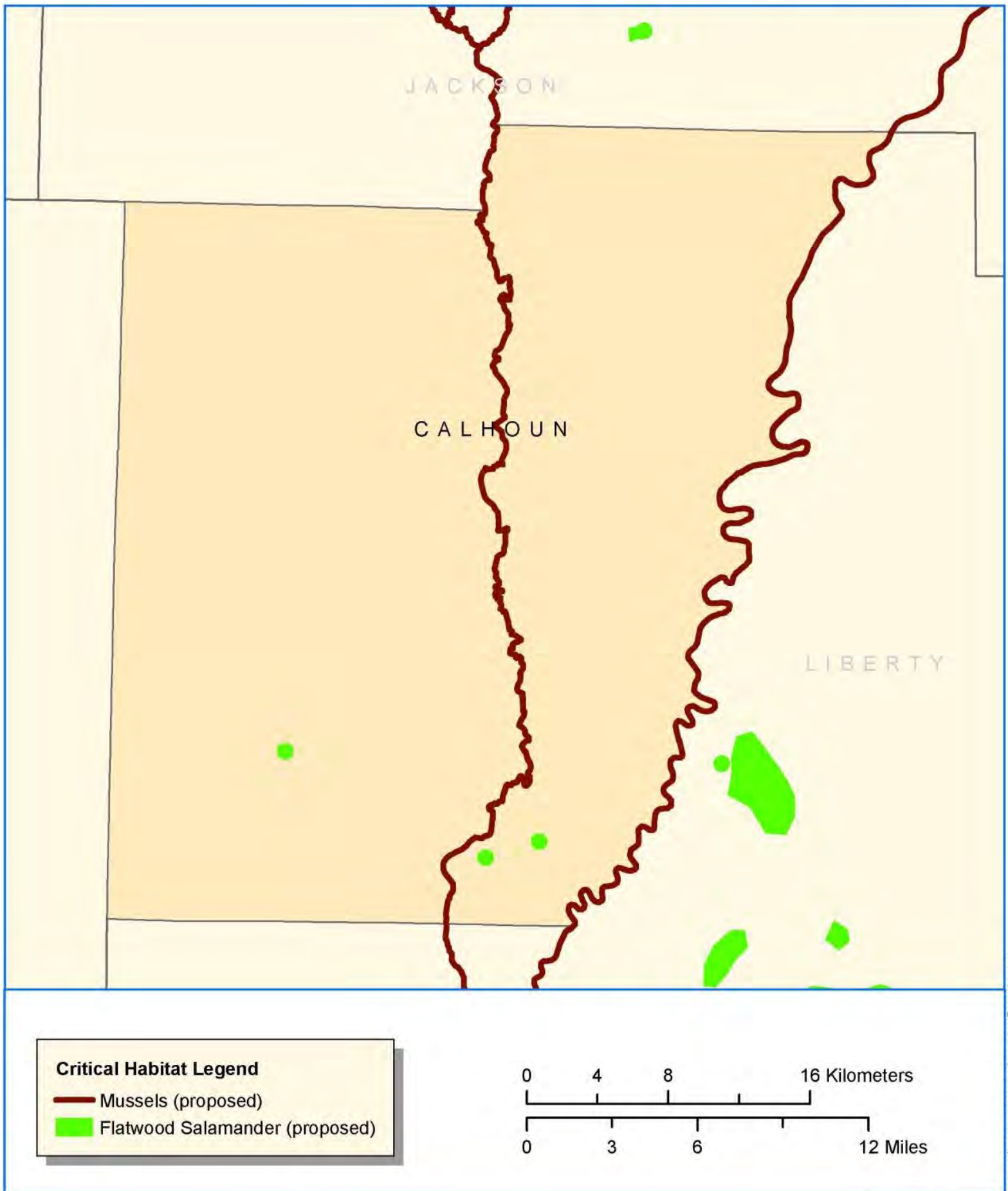
This map is for illustrative purposes only, for the precise legal Critical Habitat designation please refer to Federal Register notices

Figure 28: Critical Habitat for Gulf County



U.S. Fish and Wildlife Service

Critical Habitat for Calhoun County, Florida



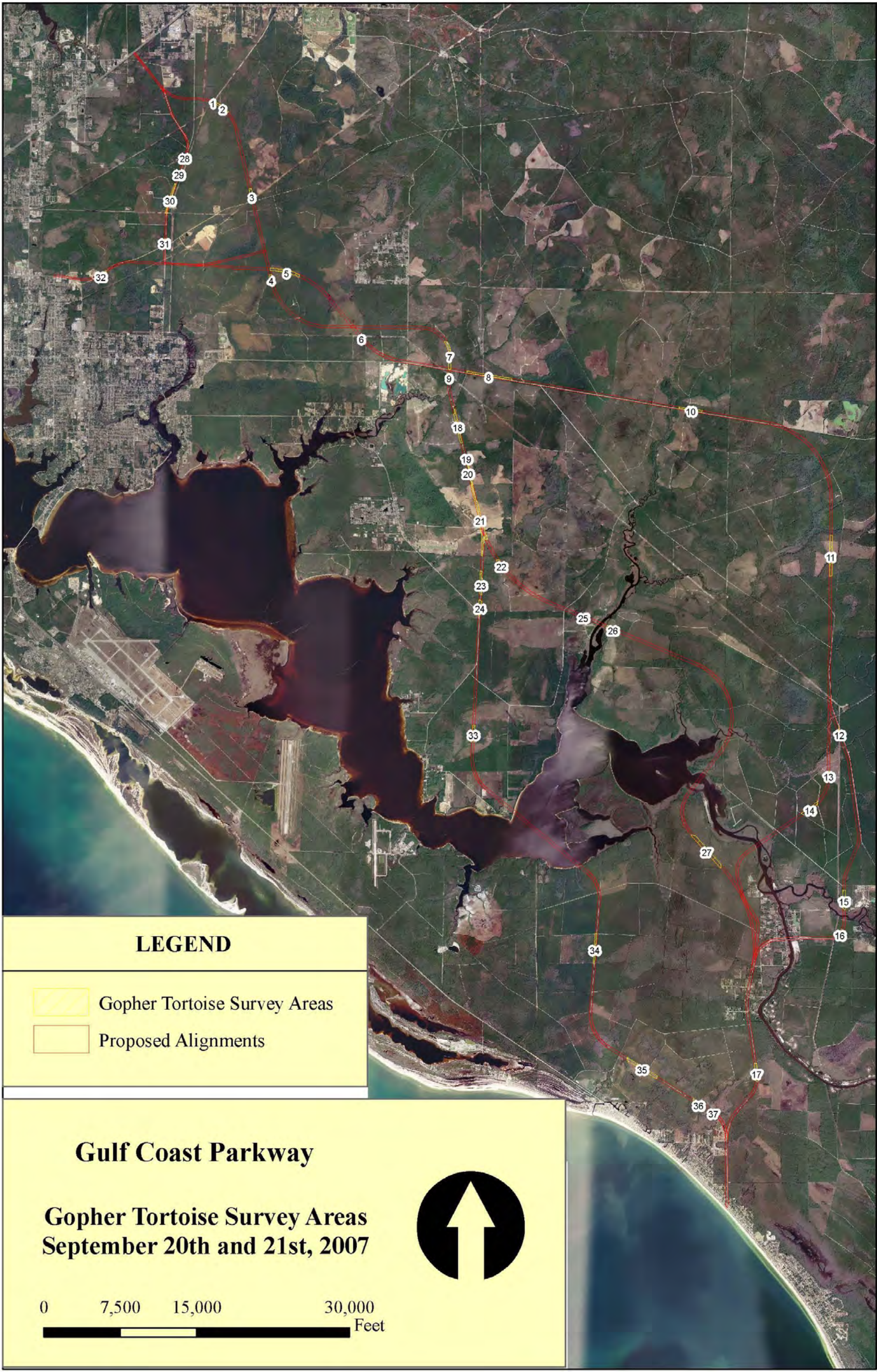
Source: USFWS

Panama City Field Office
March 2007

Figure 29: Critical Habitat for Calhoun County

This map is for illustrative purposes only, for the precise legal Critical Habitat designation please refer to Federal Register notices

Figure 30: Gopher Tortoise Survey Areas



A-31



Figure 32: Threatened and Endangered Species Occurrences

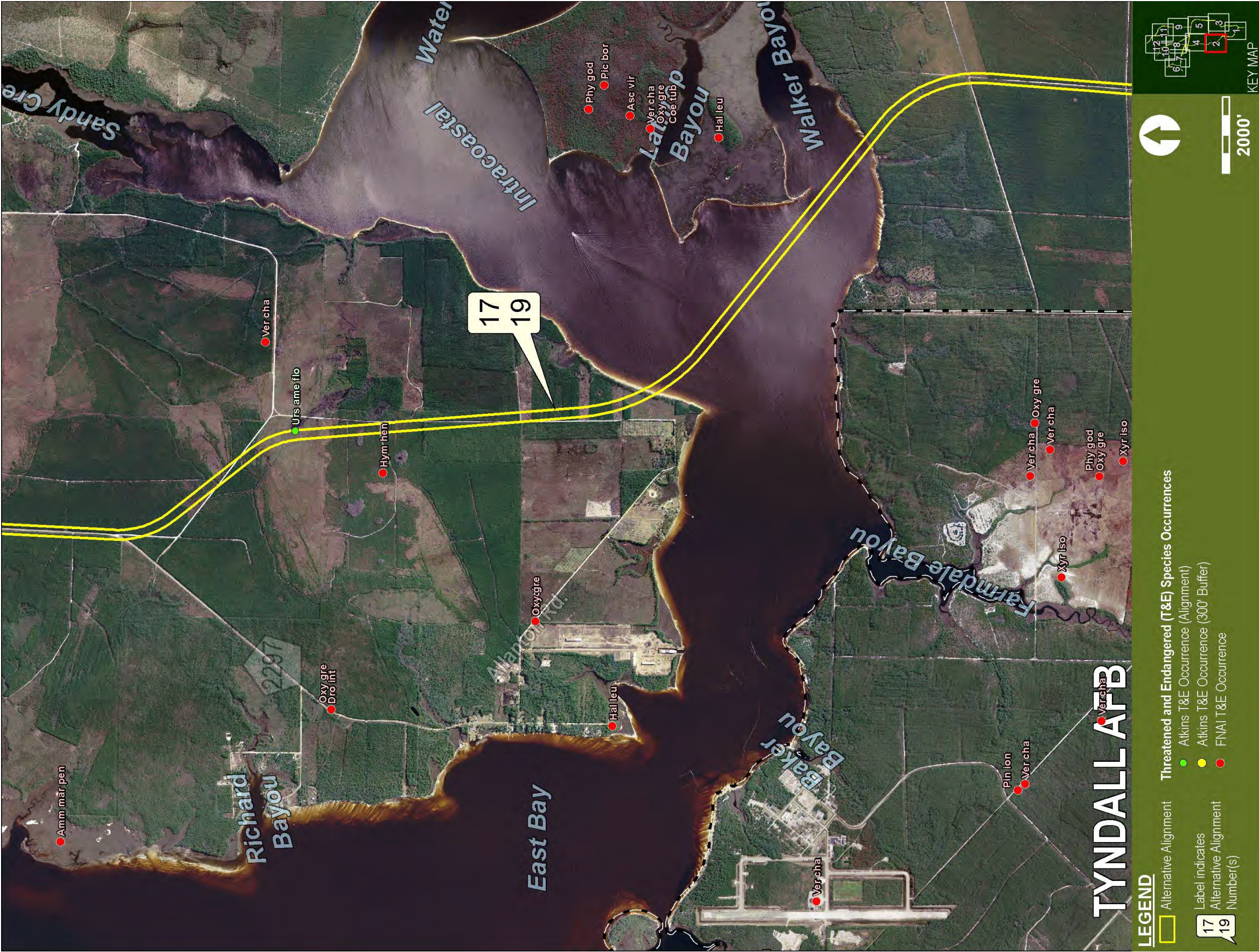


Figure 33: Threatened and Endangered Species Occurrences

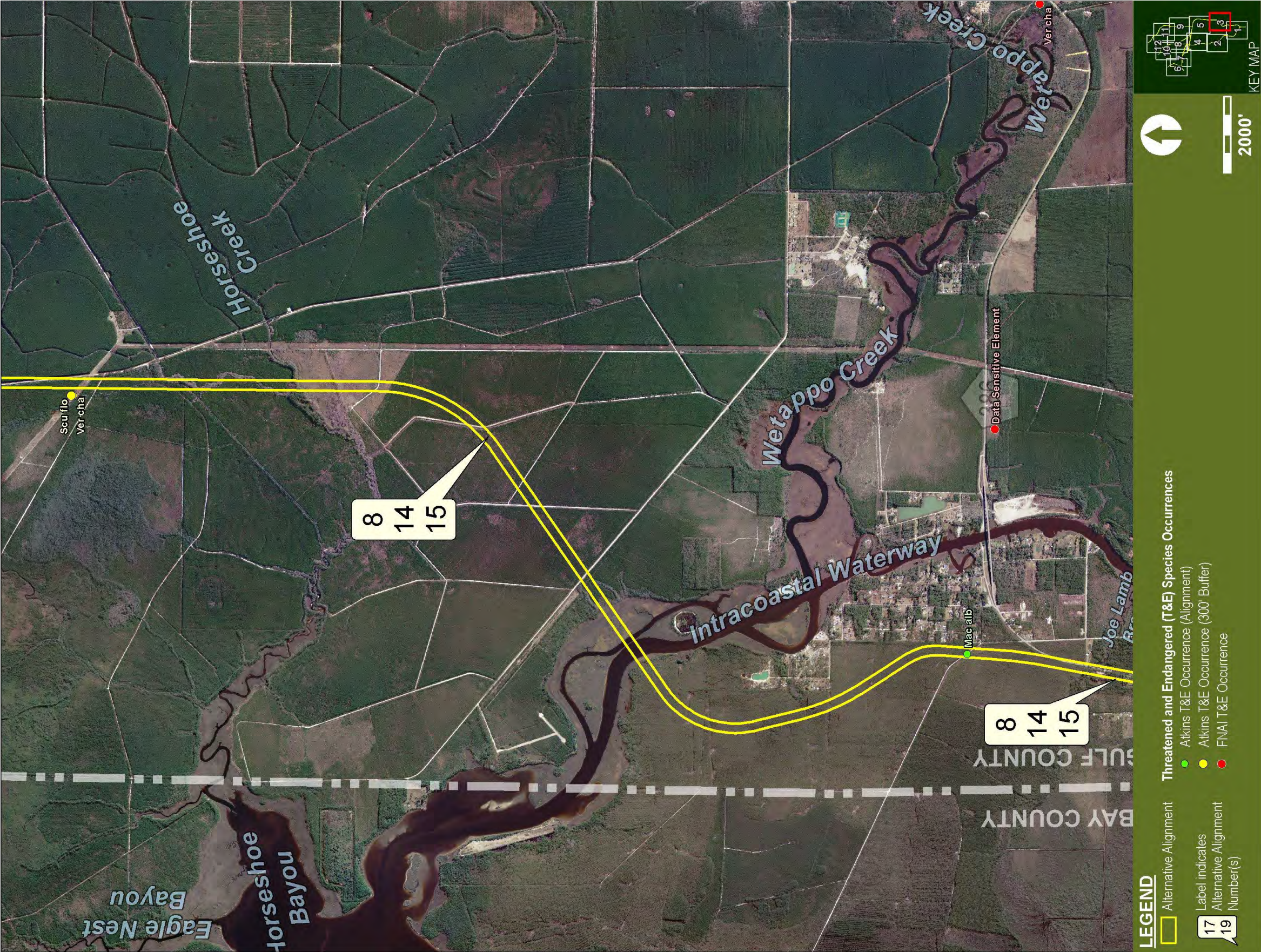
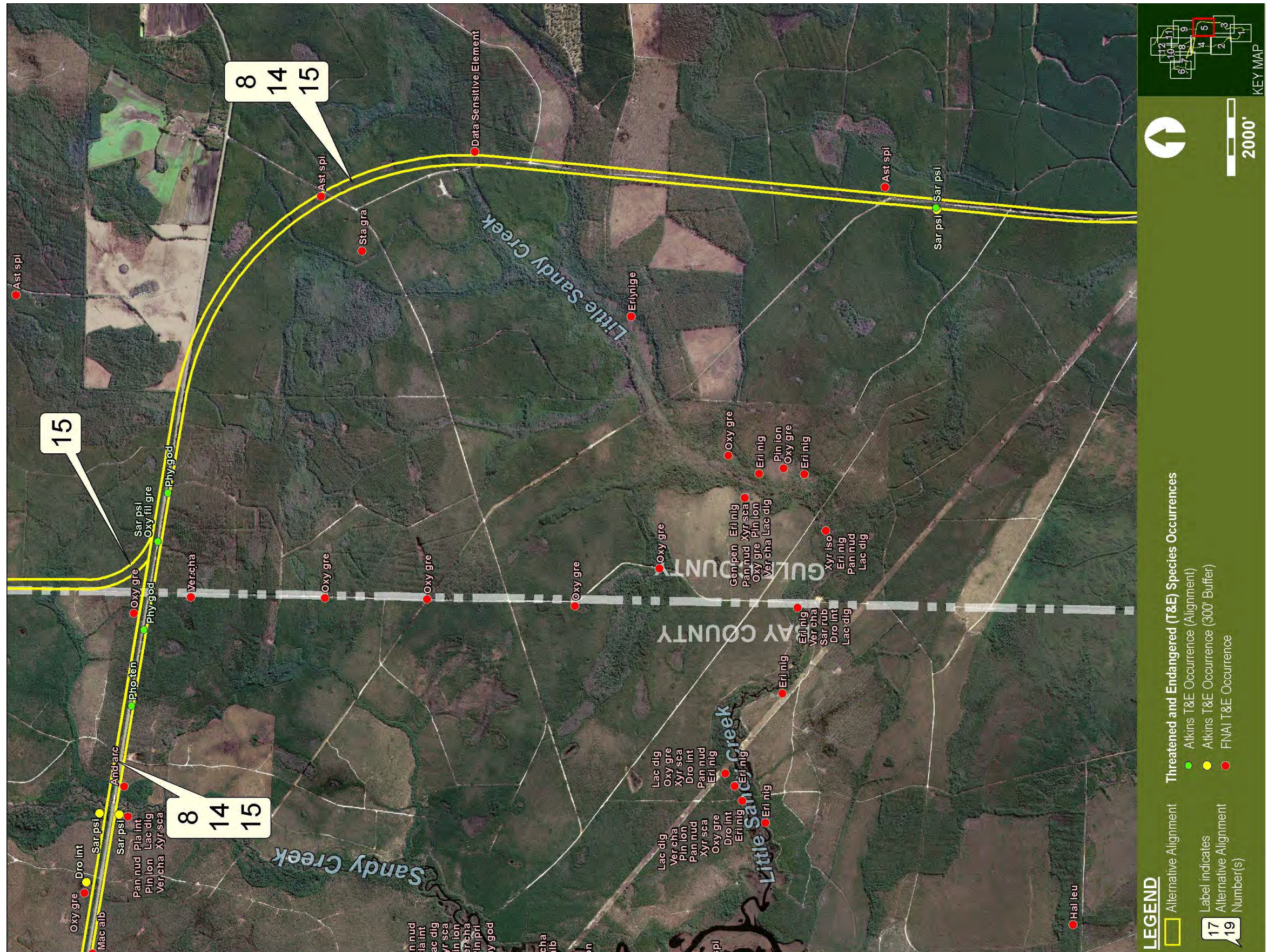


Figure 34: Threatened and Endangered Species Occurrences



A-35



A-36



A-37

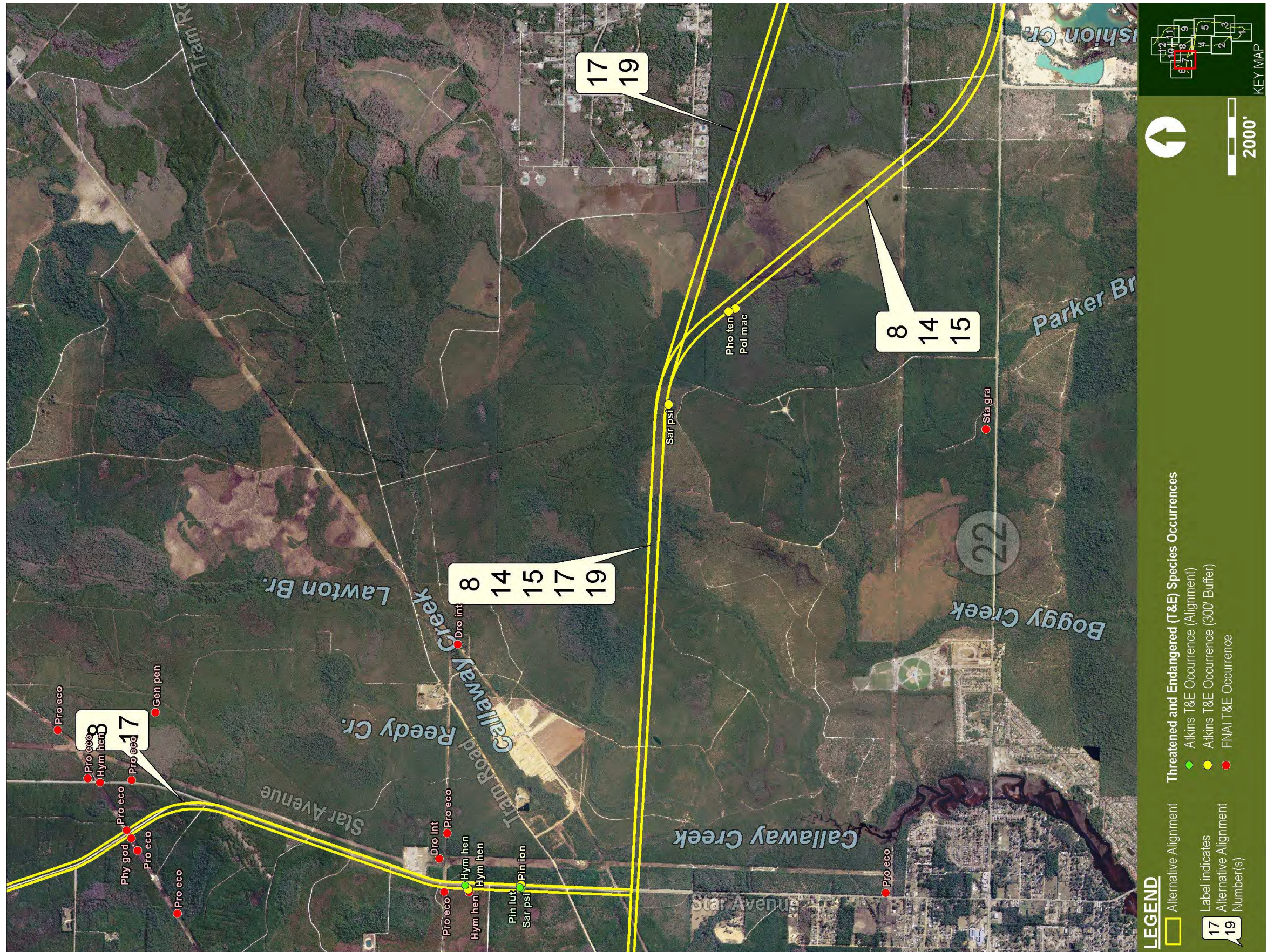


Figure 38: Threatened and Endangered Species Occurrences

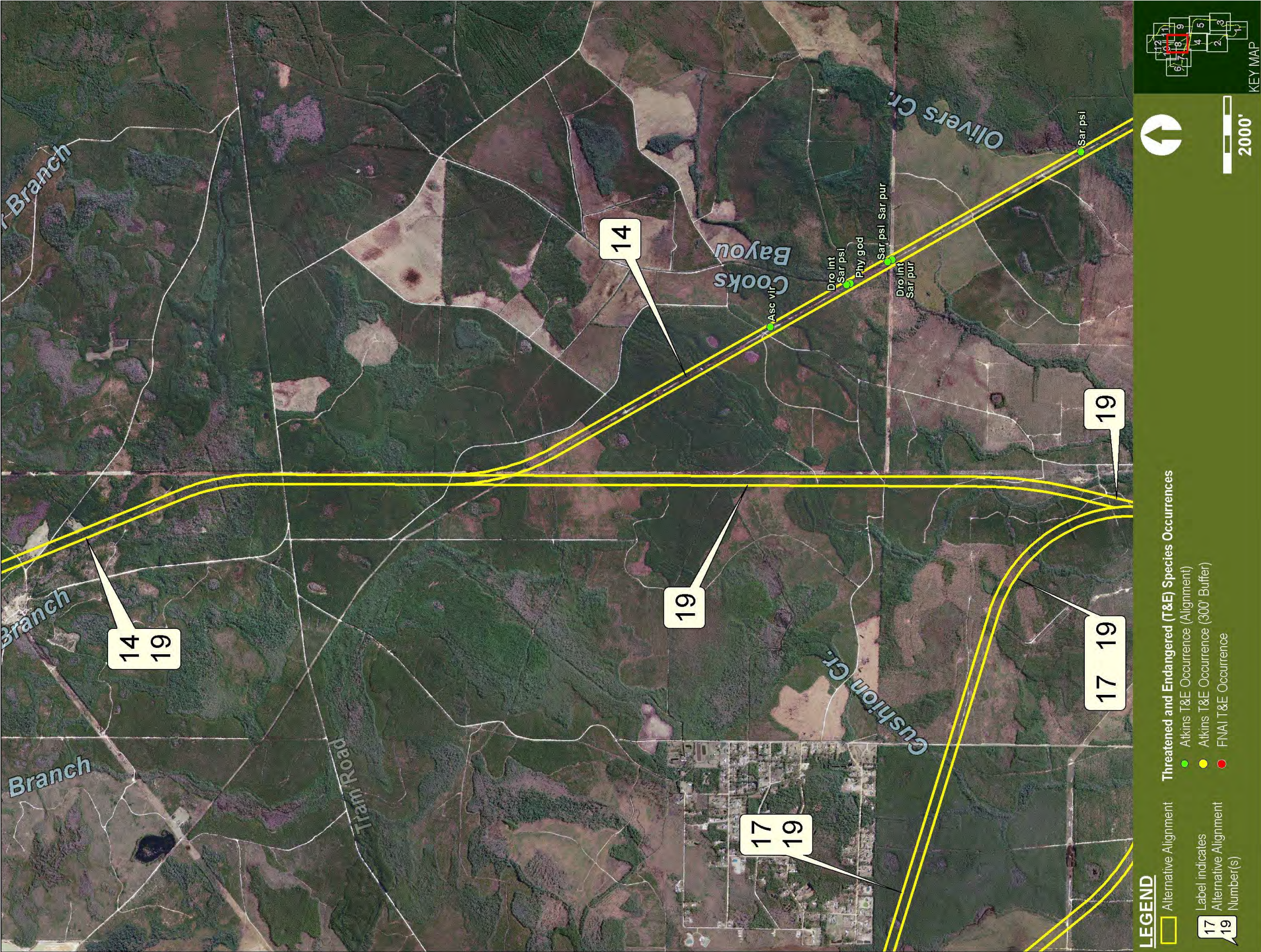


Figure 39: Threatened and Endangered Species Occurrences



Figure 40: Threatened and Endangered Species Occurrences

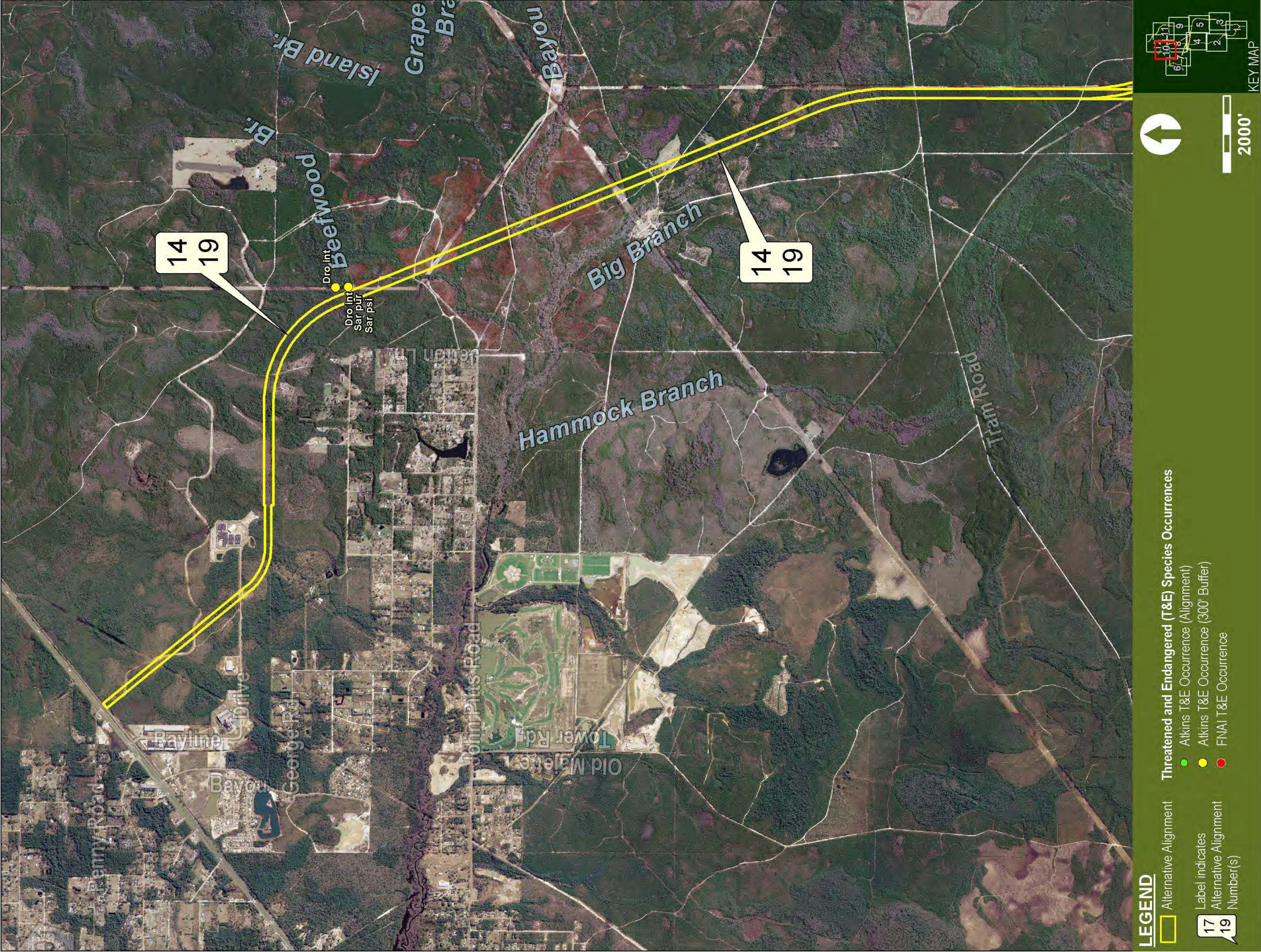


Figure 41: Threatened and Endangered Species Occurrences



Figure 42: Threatened and Endangered Species Occurrences



Figure 43: Black Bear Road Kills



Figure 44: Black Bear Road Kills

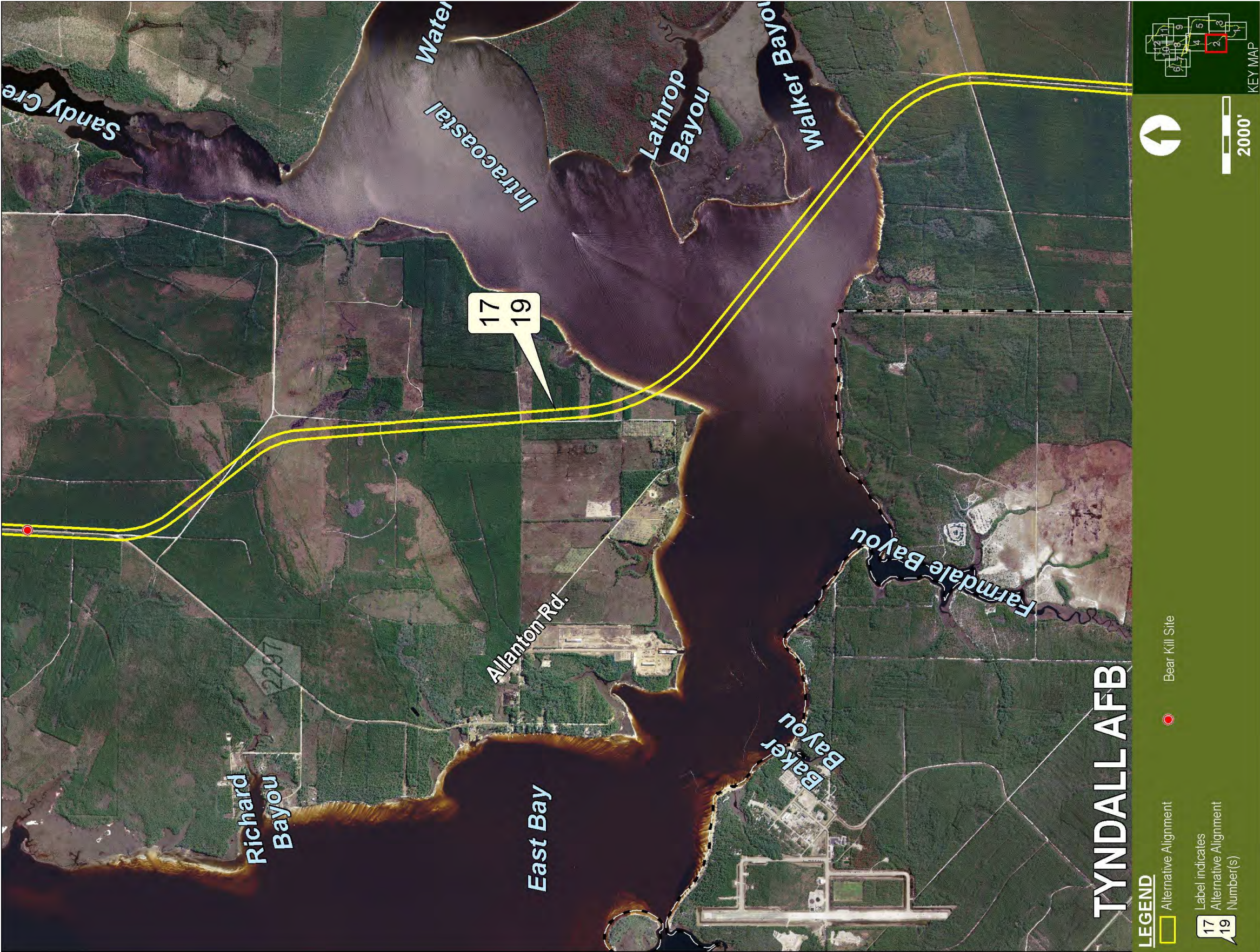


Figure 45: Black Bear Road Kills

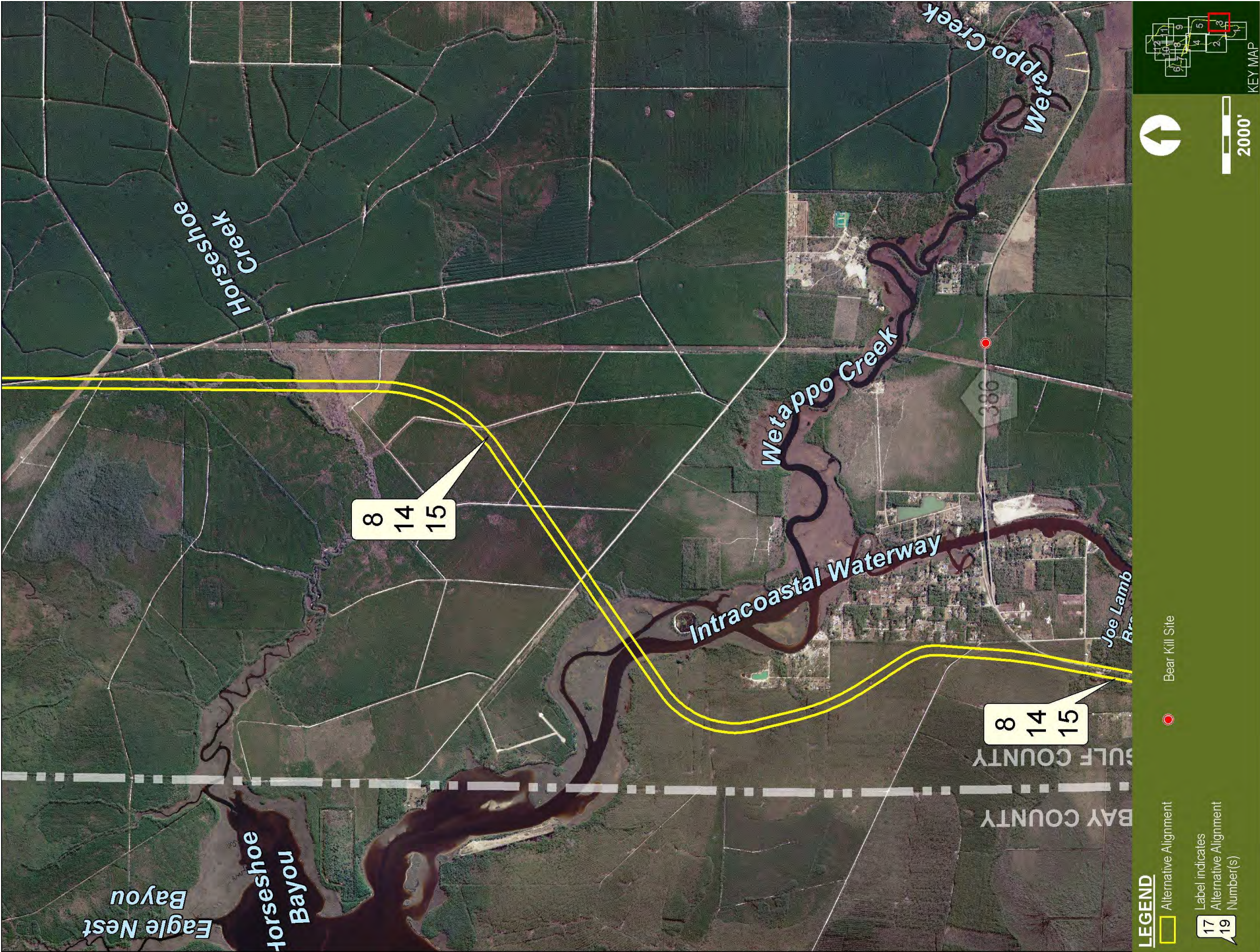


Figure 46: Black Bear Road Kills



Figure 47: Black Bear Road Kills

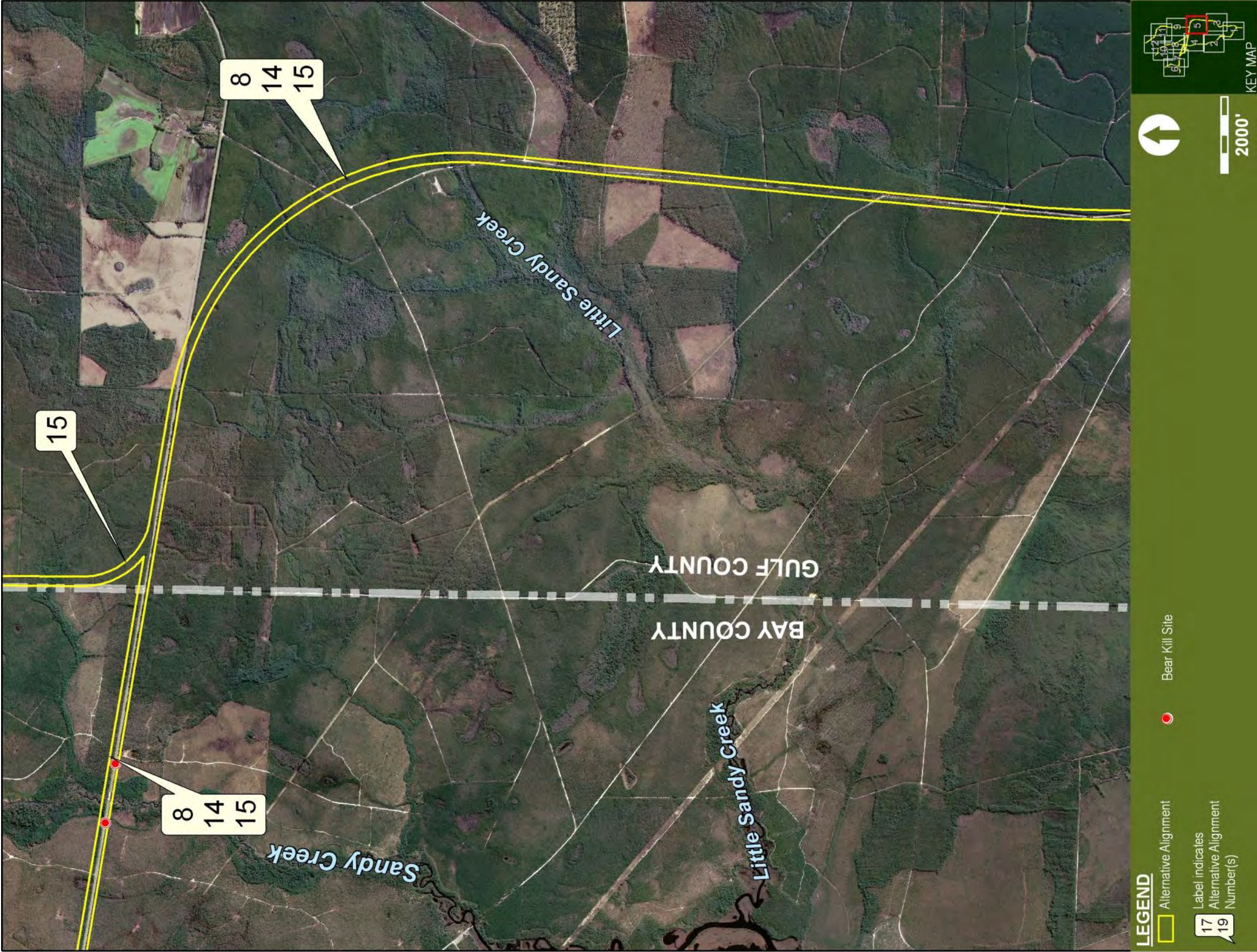


Figure 48: Black Bear Road Kills

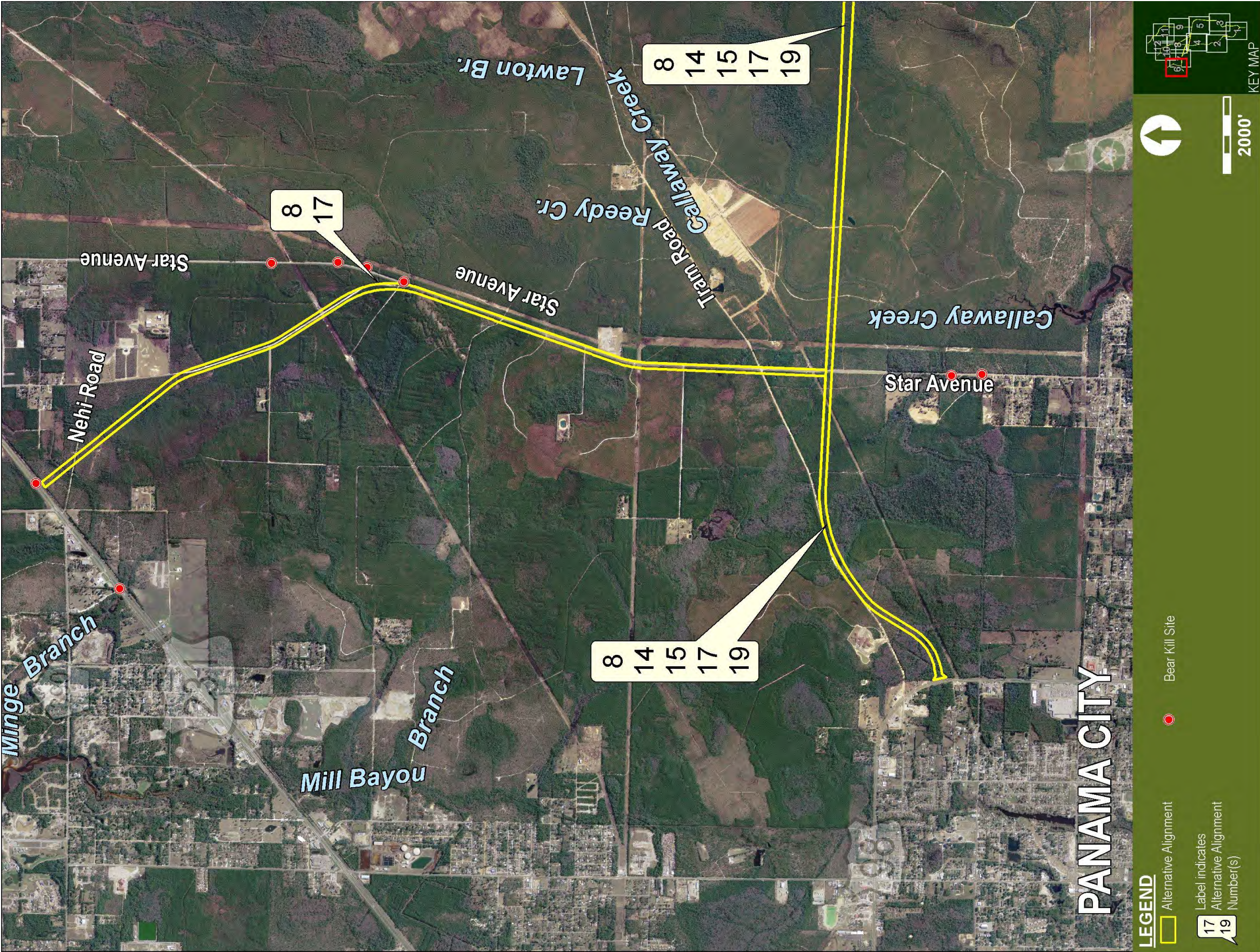


Figure 49: Black Bear Road Kills

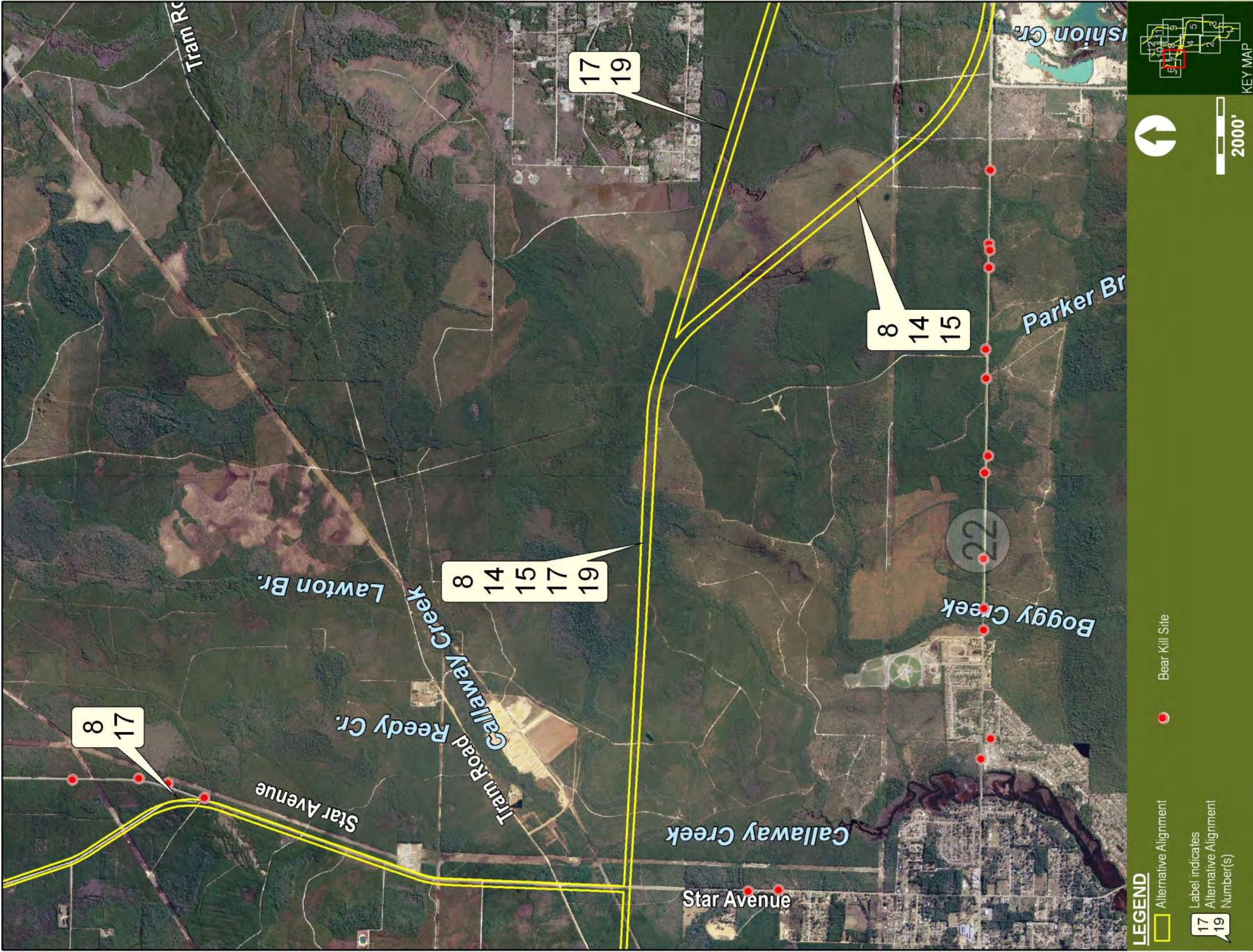


Figure 50: Black Bear Road Kills

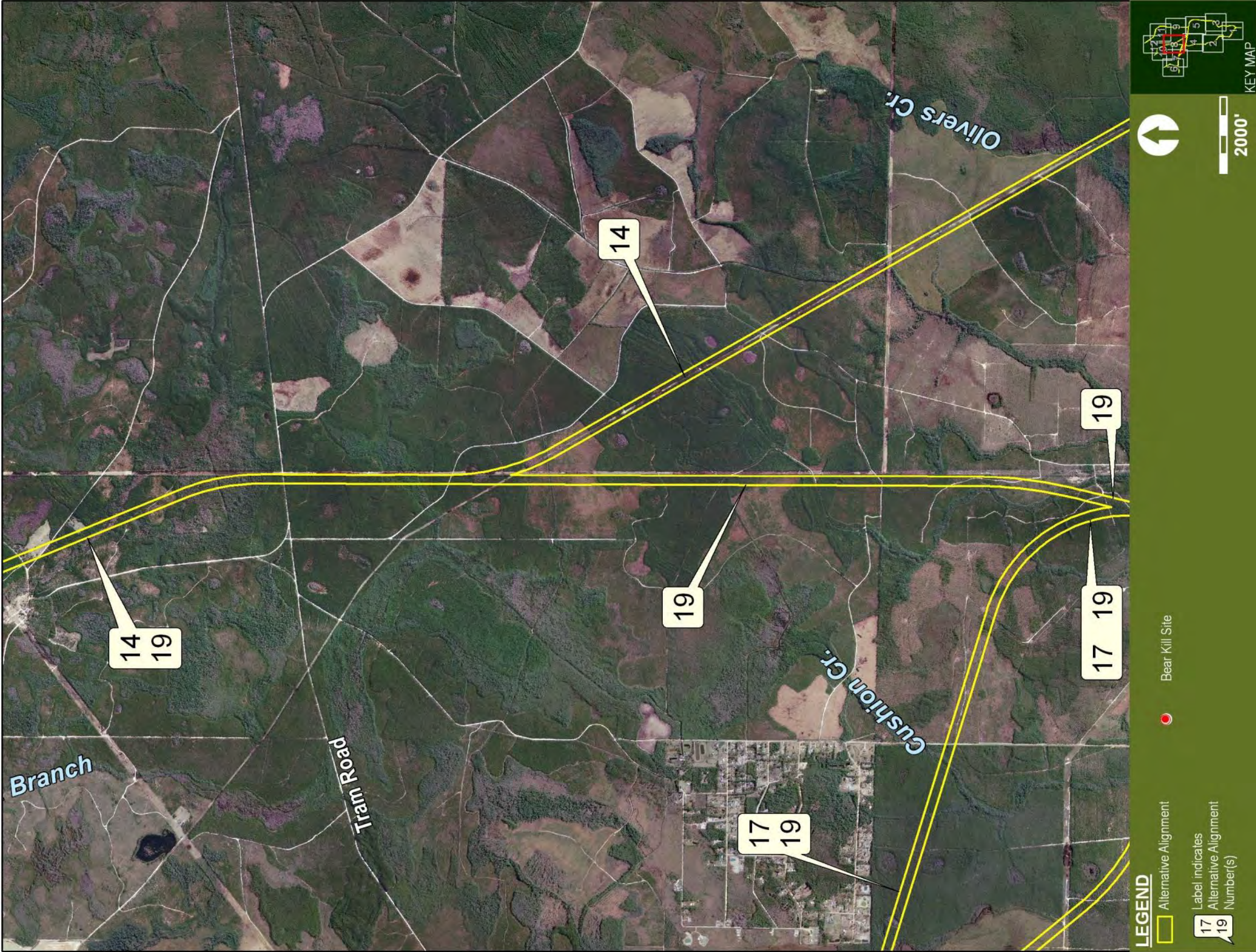


Figure 51: Black Bear Road Kills

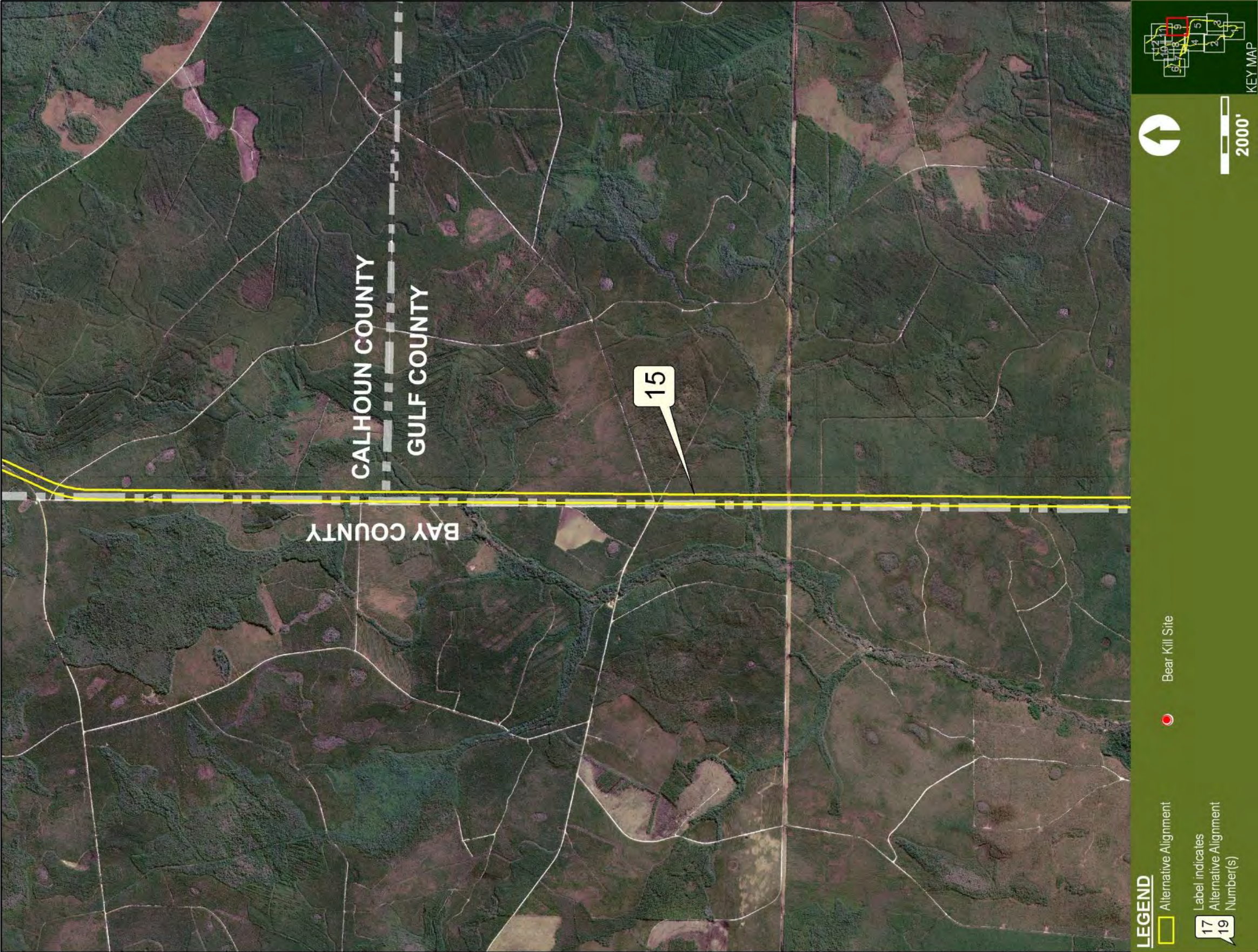


Figure 52: Black Bear Road Kills



Figure 53: Black Bear Road Kills

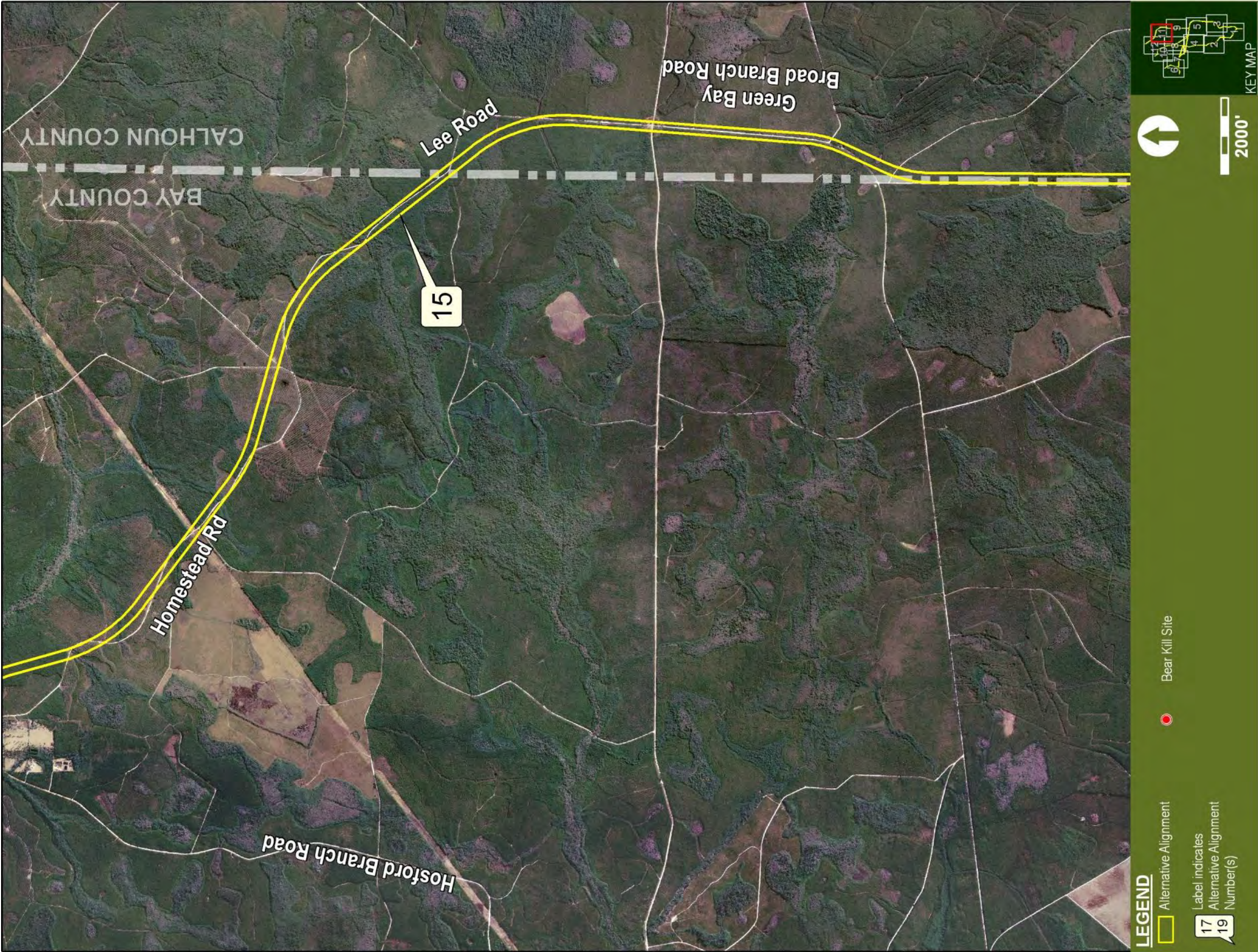
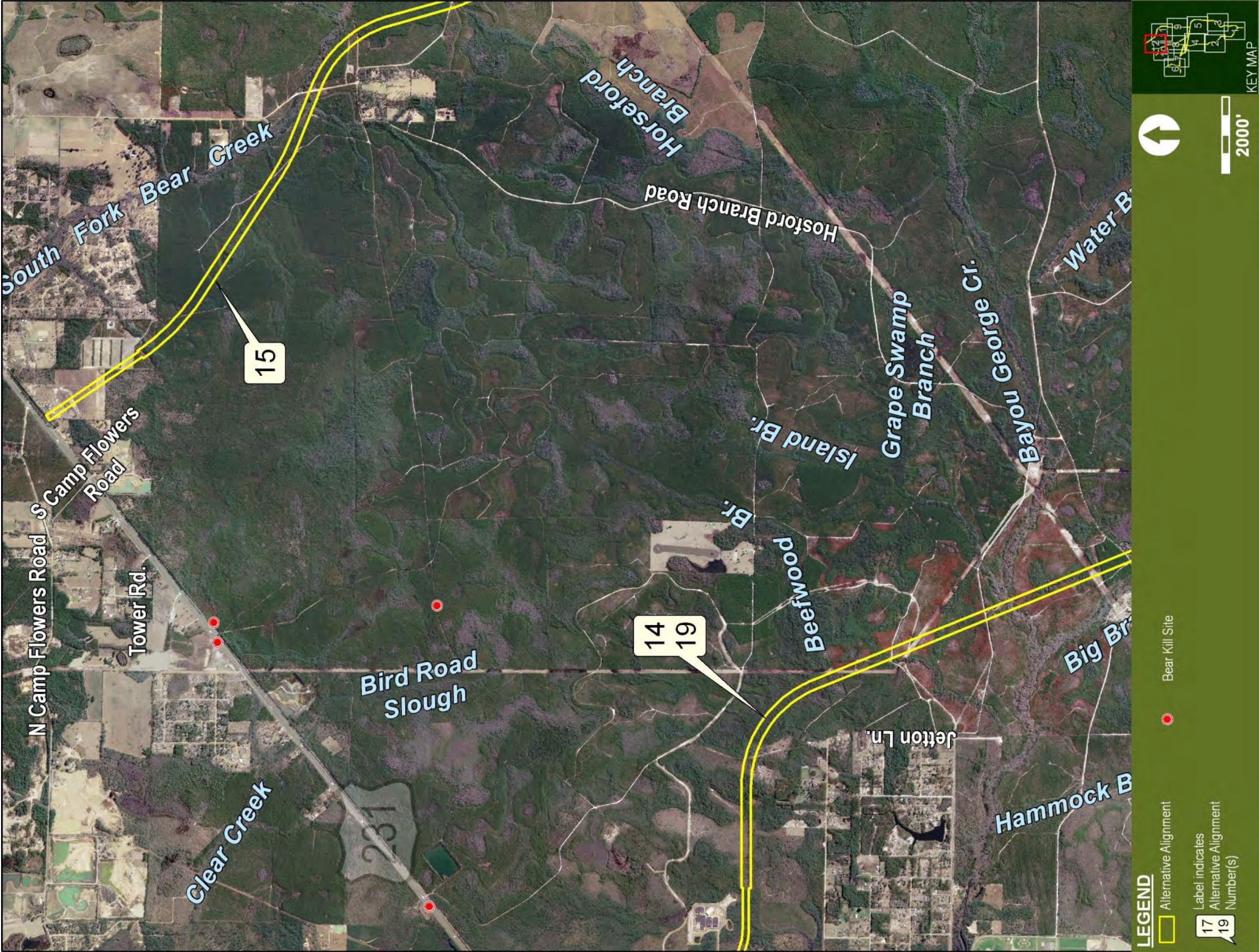


Figure 54: Black Bear Road Kills



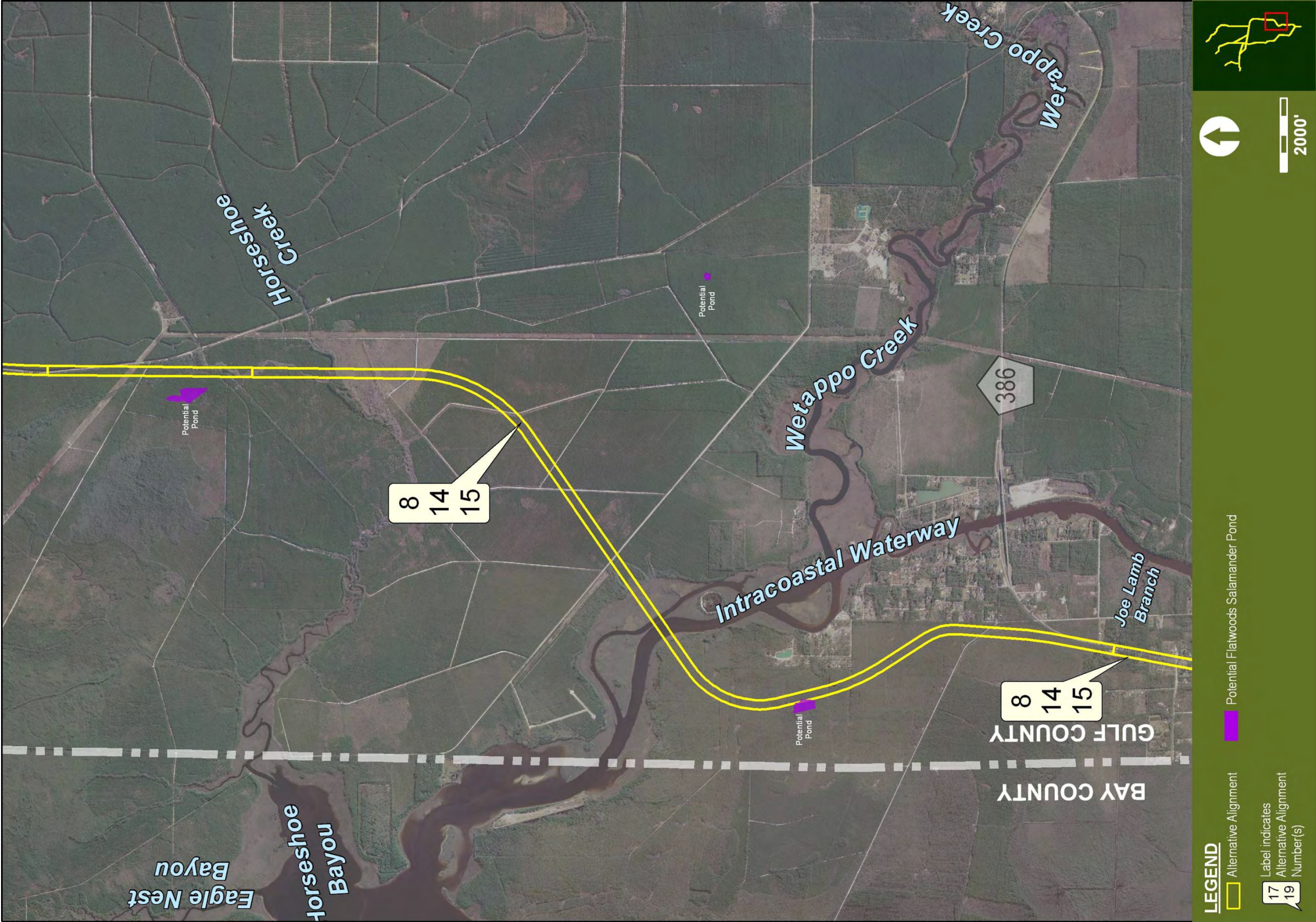
Figures 55: Potential Reticulated Flatwoods Salamander Breeding Ponds per Desktop Analysis



Figures 56: Potential Reticulated Flatwoods Salamander Breeding Ponds per Desktop Analysis



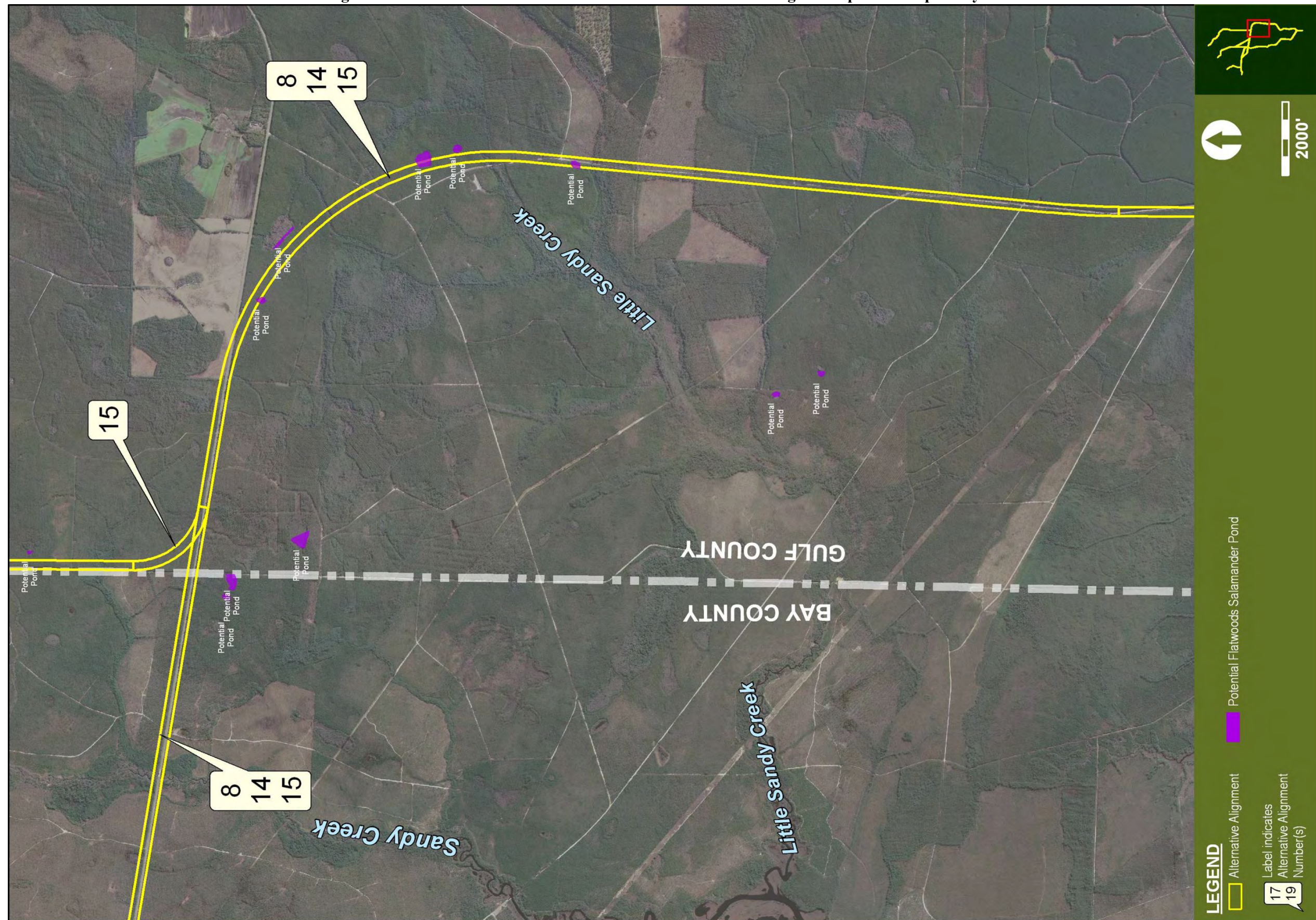
Figures 57: Potential Reticulated Flatwood Salamander Breeding Ponds per Desktop Analysis



Figures 58: Potential Reticulated Flatwoods Salamander Breeding Ponds per Desktop Analysis



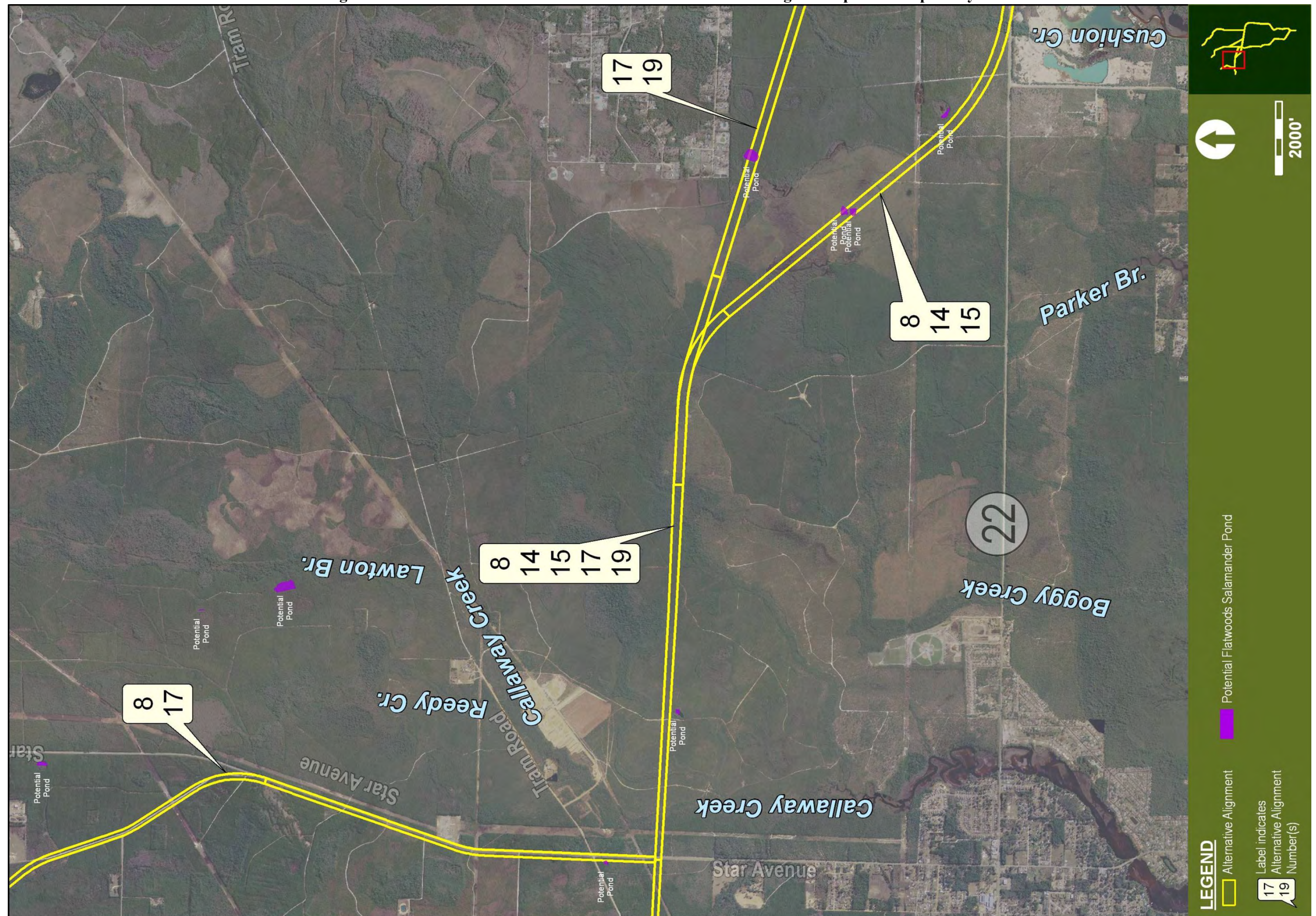
Figures 59: Potential Reticulated Flatwoods Salamander Breeding Ponds per Desktop Analysis



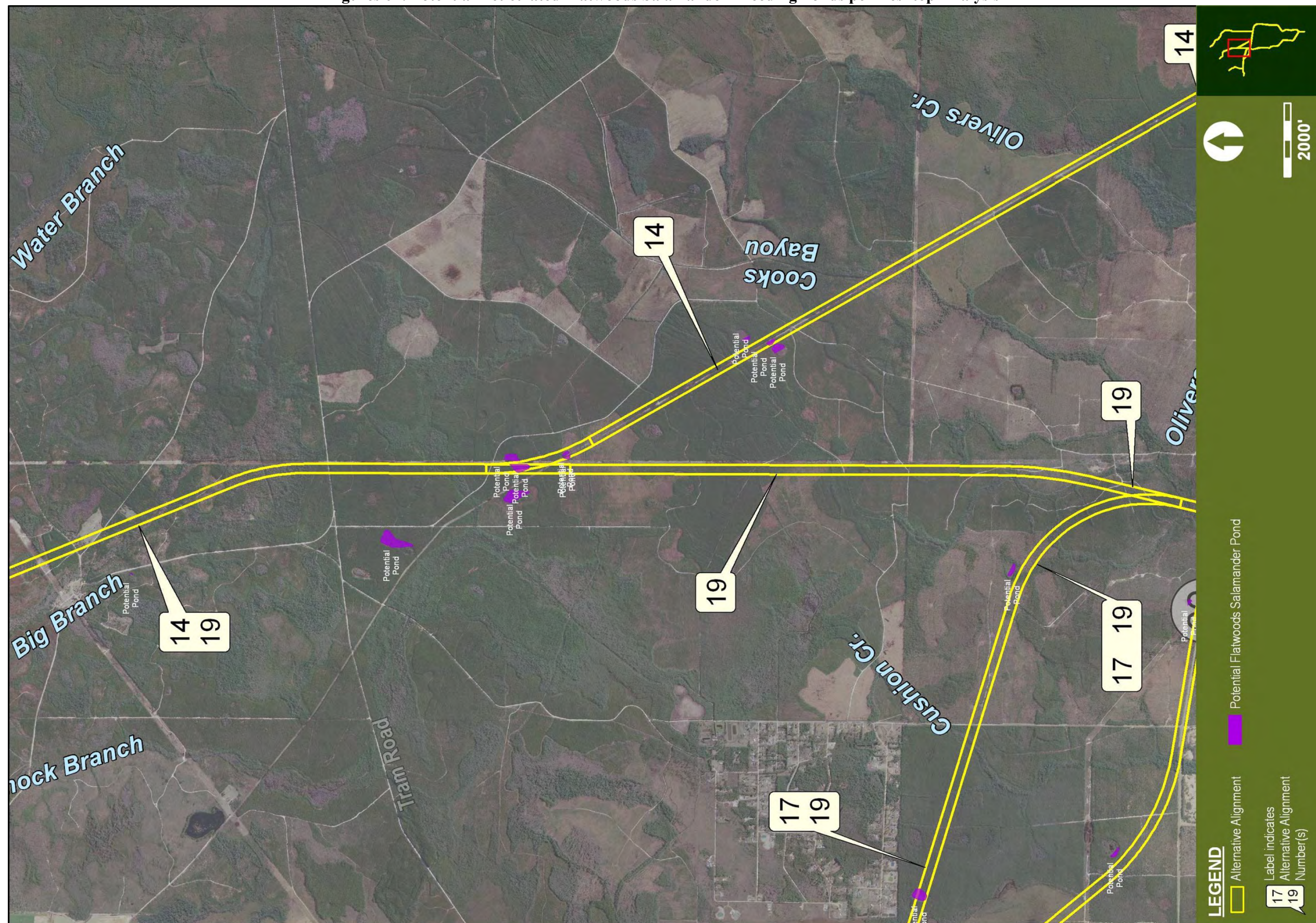
Figures 60: Potential Reticulated Flatwoods Salamander Breeding Ponds per Desktop Analysis



Figures 61: Potential Reticulated Flatwoods Salamander Breeding Ponds per Desktop Analysis



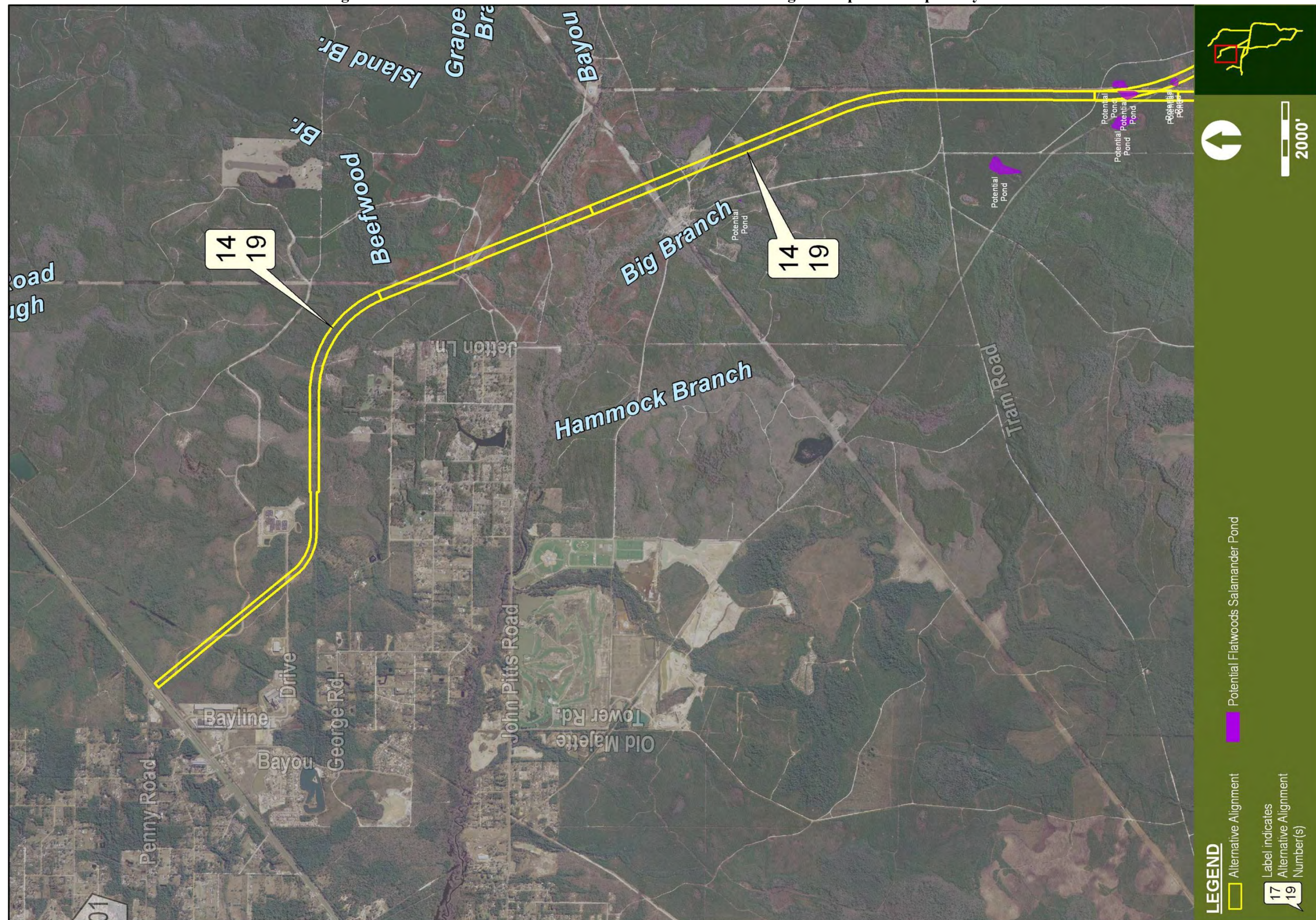
Figures 62: Potential Reticulated Flatwoods Salamander Breeding Ponds per Desktop Analysis



Figures 63: Potential Reticulated Flatwoods Salamander Breeding Ponds per Desktop Analysis



Figures 64: Potential Reticulated Flatwoods Salamander Breeding Ponds per Desktop Analysis



Figures 65: Potential Reticulated Flatwoods Salamander Breeding Ponds per Desktop Analysis

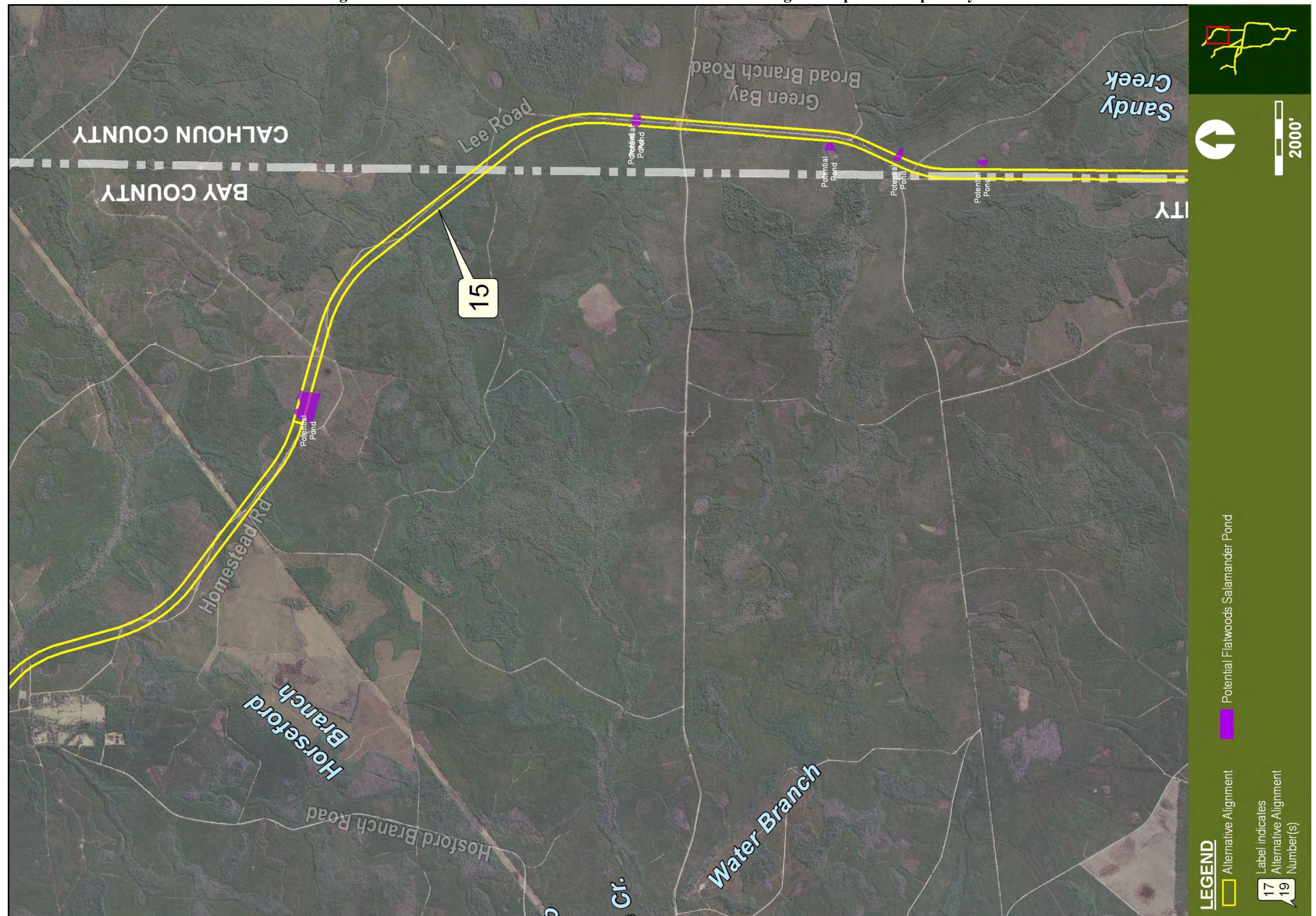
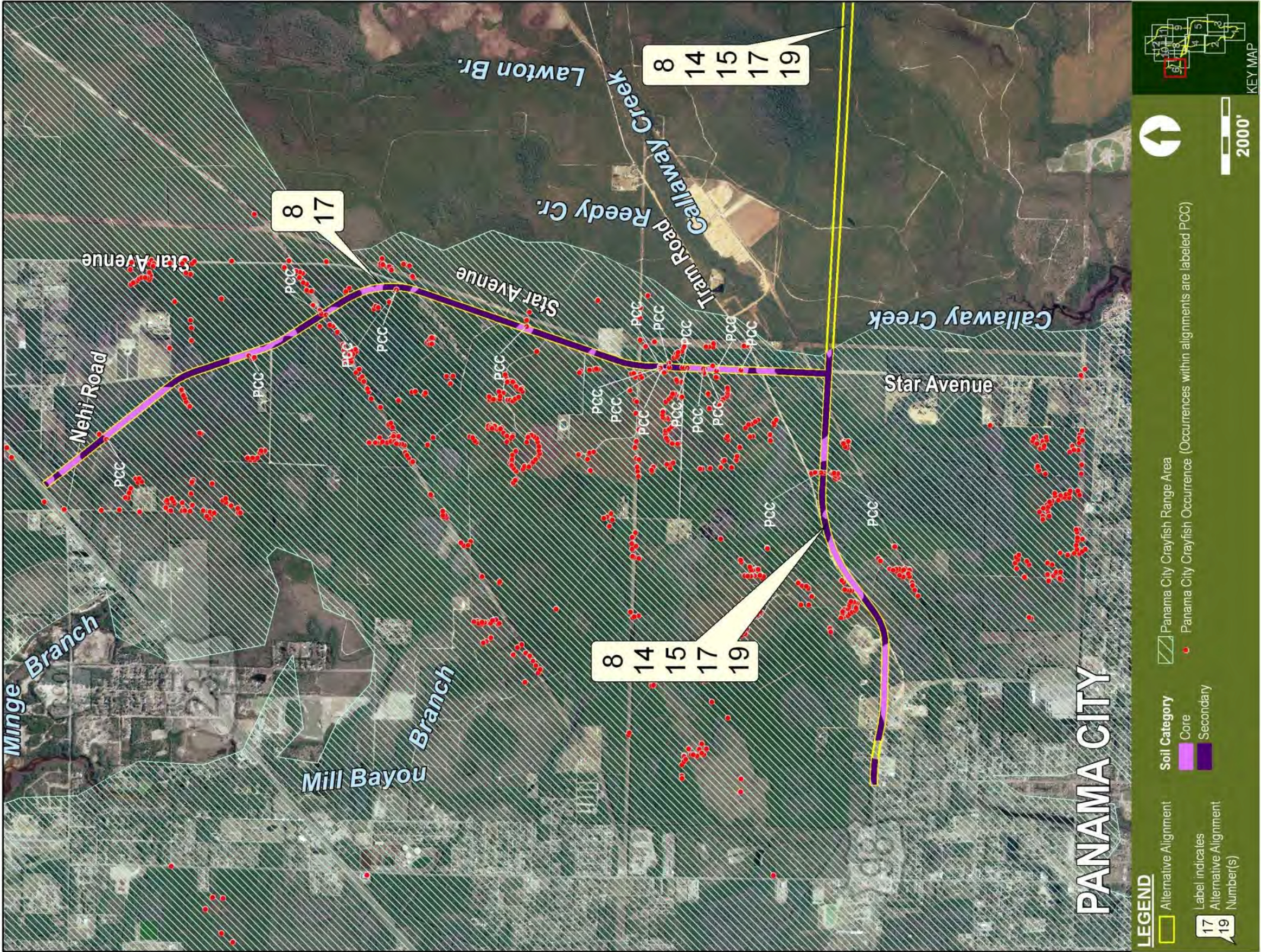


Figure 66: Panama City Crayfish Range, Habitat, and Occurrences per FFWCC



APPENDIX B

CONSTRUCTION MEASURES

CONSTRUCTION SPECIAL PROVISIONS
GULF STURGEON PROTECTION GUIDELINES
(PURSUANT TO NMFS AND USFWS)

The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is listed under the Endangered Species Act as threatened. It is managed under the joint jurisdiction of the NMFS and the U.S. Fish and Wildlife Service (USFWS). Potential habitat for the Gulf sturgeon is located within the limits of this project.

The following special provisions will be incorporated into any construction contract where involvement with sturgeon may occur:

The FDOT has coordinated with the NMFS and USFWS early in the project development stage. The following provisions are intended to avoid/ protect known spawning habitats, nursery areas, feeding areas and thermal refuges.

1. The Florida Department of Transportation (FDOT) shall advise all FDOT project personnel and Contractor personnel on the project that there are civil and criminal penalties for harming, harassing or killing sturgeon. The FDOT and the Contractor will be held responsible for any sturgeon harmed, harassed, or killed as a result of the project activity.
2. The FDOT shall provide information to all FDOT and Contract personnel for identification of sturgeon.
3. Appropriate work shift personnel will be instructed in the appearance, habits, biology, migratory patterns, and preservation of sturgeon. At least one of these trained personnel will be on site during construction activities to maintain a constant surveillance for these species, assure the cessation of activities (such as dredging, excess turbidity, and construction barge activity), which may endanger these species, and assure that uninhibited passage for the animals is provided.
4. Post signs on site warning of the presence of sturgeon, of their endangered status and federal protection, and precautions needed.
5. Turbidity from construction activity will be adequately controlled to prevent degradation of the quality and transparency of the water. When sturgeon are present, turbidity curtains of appropriate dimension will be used to restrict the animals' access to the work area. Pollution booms or turbidity curtains should use tangle resistant or hemp rope when anchoring, or employ surface anchors to prevent entangling sturgeon. Continuous surveillance will be maintained in order to free animals which may become trapped in silt or turbidity barriers.
6. No dredging of the river bottom will be conducted for barge access.

7. Drilled shaft pile construction will be used whenever prudent and feasible as determined by FDOT.
8. Care shall be taken in lowering equipment or material below the water surface and into the stream bed. These precautions will be taken to ensure no harm occurs to any sturgeon which may enter the construction area undetected.
9. Construction debris shall not be discarded into the water.
10. If the use of explosives is necessary, the following protection measures will be employed for projects in FDOT's District 3
 - a. In riverine areas:
 - No blasting will occur in known spawning, staging, feeding, or nursery areas.
 - In-water explosive work should be avoided between the months of April to October.
 - If explosive work becomes necessary within the April to October time frame, a non-lethal "Fish Scare" charge will be detonated one minute prior to detonation of the underwater blast.
 - b. In estuarine areas:
 - No blasting will occur in known spawning, staging, feeding, or nursery areas.
 - In-water explosive work should be avoided between the months of October to April.
 - If explosive work becomes necessary within the October to April time frame, a non-lethal "Fish Scare" charge will be detonated one minute prior to detonation of the underwater blast.
 - c. In the event that a sturgeon is killed during blasting, the NMFS and the USFWS will be notified immediately.

National Marine Fisheries Service
by email at:
takereport.nmfsser@noaa.gov

US Fish and Wildlife Service
1601 Balboa Ave.
Panama City, Florida 32405
Tel: (850) 769-0552

11. Any sturgeon carcass will be secured on site or held in a freezer until an agency representative arranges for its transport for analysis.
12. Following completion of the project, a report summarizing any involvement with sturgeon will be prepared for USFWS and NMFS.

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

1. An eastern indigo snake protection/education plan shall be developed by the applicant or requestor for all construction personnel to follow. The plan shall be provided to the Service for review and approval at least 30 days prior to any clearing activities. The educational materials for the plan may consist of a combination of posters, videos, pamphlets, and lectures (*e.g.*, an observer trained to identify eastern indigo snakes could use the protection/education plan to instruct construction personnel before any clearing activities occur). Informational signs should be posted throughout the construction site and along any proposed access road to contain the following information:
 - a. a description of the eastern indigo snake, its habits, and protection under Federal Law;
 - b. instructions not to injure, harm, harass or kill this species;
 - c. directions to cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site on its own before resuming clearing; and,
 - d. telephone numbers of pertinent agencies to be contacted if a dead eastern indigo snake is encountered. The dead specimen should be thoroughly soaked in water and then frozen.
2. If not currently authorized through an Incidental Take Statement in association with a Biological Opinion, only individuals who have been either authorized by a section 10(a)(1)(A) permit issued by the Service, or by the State of Florida through the Florida Fish Wildlife Conservation Commission (FWC) for such activities, are permitted to come in contact with an eastern indigo snake.
3. An eastern indigo snake monitoring report must be submitted to the appropriate Florida Field Office within 60 days of the conclusion of clearing phases. The report should be submitted whether or not eastern indigo snakes are observed. The report should contain the following information:
 - a. any sightings of eastern indigo snakes and
 - b. other obligations required by the Florida Fish and Wildlife Conservation Commission, as stipulated in the permit.

Revised February 12, 2004

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

July 2005

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

- a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
- b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Any collision with or injury to a manatee shall be reported immediately to the FWC Hotline at 1-888-404-FWCC. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-232-2580) for north Florida or Vero Beach (1-561-562-3909) for south Florida.
- f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Awareness signs that have already been approved for this use by the Florida Fish and Wildlife Conservation Commission (FWC) must be used. One sign measuring at least 3 ft. by 4 ft. which reads *Caution: Manatee Area* must be posted. A second sign measuring at least 8 1/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities.

FWC Approved Manatee Educational Sign Suppliers

ASAP Signs & Designs

624-B Pinellas Street
Clearwater, FL 33756
Phone: (727) 443-4878
Fax: (727) 442-7573

Wilderness Graphics, Inc.

P. O. Box 1635
Tallahassee, FL 32302
Phone: (850) 224-6414
Fax: (850) 561-3943
www.wildernessgraphics.com

Cape Coral Signs & Designs

1311 Del Prado Boulevard
Cape Coral, FL 33990
Phone: (239) 772-9992
Fax: (239) 772-3848

Municipal Supply & Sign Co.

1095 Fifth Avenue, North
P. O. Box 1765
Naples, FL 33939-1765
Phone: (800) 329-5366 or
(239) 262-4639
Fax: (239) 262-4645
www.municipalsigns.com

Vital Signs

104615 Overseas Highway
Key Largo, FL 33037
Phone: (305) 451-5133
Fax: (305) 451-5163

Universal Signs & Accessories

2912 Orange Avenue
Ft. Pierce, FL 34947
Phone: (800) 432-0331 or
(772) 461-0665
Fax: (772) 461-0669

New City Signs

1829 28th Street North
St. Petersburg, FL 33713
Phone: (727) 323-7897
Fax: (727) 323-1897

**United Rentals Highway
Technologies**

309 Angle Road
Ft. Pierce, FL 34947
Phone: (772) 489-8772
or (800) 489-8758 (FL only)
Fax: (772) 489-8757

CAUTION: MANATEE HABITAT

All project vessels
IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work
all in-water activities must
SHUT DOWN

Report any collision or injury to:
1-888-404-FWCC (1-888-404-3922)

Florida Fish and Wildlife Conservation Commission

APPENDIX C

AGENCY COORDINATION

**5/18/11 USFWS Comments on Draft ESBAR
FDOT Response Letter**



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Field Office
1601 Balboa Avenue
Panama City, FL 32405-3721
Tel: (850) 769-0552
Fax: (850) 763-2177

May 18, 2011

Mr. Brandon Bruner
District Project Development Engineer
Florida Department of Transportation
Post Office Box 607
Chipley, Florida 32428-0607

Attn: Mr. Alan Vann

Re: FWS No. 2011-I-0304
Florida Department of Transportation
Gulf Coast Parkway PD&E Study
Endangered Species Biological Assessment
FPID #: 410981-2-28-01
Bay, Gulf, and Calhoun Counties, Florida

Dear Mr. Bruner:

Thank you for your letter to the Fish and Wildlife Service (Service) dated April 20, 2011, providing the above-referenced project reports for our review. You are also requesting concurrence with your determination of effects for resources protected under the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This response is provided in accordance with provisions of Section 7 of the Act.

The Federal Highway Administration (FHWA) and Florida Department of Transportation (FDOT) propose to construct a new roadway – the Gulf Coast Parkway (GCP) – connecting US 98 in Gulf County to US 231 and US 98 in Bay County, Florida. Five Alternatives (8, 14, 15, 17, and 19) and a No-Build Alternative are being studied during the Project, Design, and Environment (PD&E) phase of the project. The Wetlands Report, Indirect and Cumulative Effects Report, and draft Environmental Impact Statement (EIS) are being reviewed separately by the Service, a cooperating agency on the EIS. At this time, no preferred alternative has been identified.

The GCP is proposed as a four-lane divided roadway with both rural and urban sections. Within a 168-foot right-of-way (ROW), the typical urban section will include a 46-foot grassed median and the following in each direction: two 12-foot travel lanes; paved 4-foot inside and 6.5-foot outside shoulders; 5-foot sidewalks, and a closed curb-and-gutter drainage system with

FILE

stormwater treatment. The typical rural section has a 250-foot ROW and will include a 64-foot grassed median and the following in each direction: two 12-foot travel lanes; paved 2-foot inside and 5-foot outside shoulders; and open drainage swales. A 12-foot shared use path will be located on one side of the roadway. Length varies from approximately 28 to 33 miles. All build alternatives include high level bridges either over Wetappo Creek and the Intra-coastal Waterway (ICWW) (Alternatives 8, 14, and 15) or over East Bay (Alternatives 17 and 19). Initially, only two 12-foot lanes within either typical section will be constructed. Design speed is 50 mph for the urban sections and 65 mph for the rural roadway.

Endangered Species Biological Assessment

The FDOT has provided effect determinations for federally protected species, state protected species, and other species of concern, with potential conservation measures and commitments to avoid and minimize impacts to these species. The Service cannot concur with your effect determinations until the preferred alternative is selected and commitments for protection measures are finalized. During the Efficient Transportation Decision Making (ETDM) review, the Service identified all alignments of the GCP as a Potential Dispute for Wildlife and Habitat due to the high potential for significant direct, secondary, and cumulative effects to habitat for federally protected and other fish and wildlife species. In 2007, FDOT developed Action Plans to address the Potential Dispute. The following comments are to assist you in finalizing the Endangered Species Biological Assessment (ESBA) and resolving the Potential Dispute.

Gulf Sturgeon

As indicated in the ESBA, no Gulf sturgeon critical habitat has been designated within the GCP study area, including East Bay. However, Service biologists have noted the occasional occurrence of Gulf sturgeon within the St. Andrew Bay system. The Service recommends incorporating *Construction Protection Provisions Sturgeon Protection Guidelines* during bridge construction activities to assure impacts to the sturgeon are avoided and minimized to the greatest extent practicable (enclosed). Provided that these measures are included in the final EIS, the Service could concur that the proposed work may affect, but is not likely to adversely affect (NLAA) the Gulf sturgeon.

Eastern Indigo Snake

The Service could concur with your determination that the proposed work may affect, but is NLAA the Eastern indigo snake with incorporation of *Standard Protection Measures for the Eastern Indigo Snake* during construction (enclosed).

Reticulated Flatwoods Salamander

The ESBA uses a Phase I desktop habitat evaluation model to identify potential flatwoods salamander breeding ponds across the five alternatives. The report separates involvement into direct (within the alignment) and indirect (within 1,500 feet of the alignment) impacts to breeding ponds. As you are aware, habitat for the reticulated flatwoods salamander has three components: the breeding pond, ecotone, and upland. Upland habitat extends up to 1,500 feet from the edge of a breeding pond. Therefore, upland habitat for the flatwoods salamander could be directly impacted if suitable ponds are located within 1,500 feet of the alignment.

Potential breeding ponds are identified for all five alternatives. While the ESBA notes overall poor flatwoods salamander habitat conditions during limited wetlands surveys, more detailed information is needed before the Service can provide concurrence with your determination. We recommend completing a Phase II field evaluation of all potential ponds once a preferred alternative is selected. Your effect determination should be based the Phase II evaluation. Score sheets, aerial maps, and site photos should be provided to the Service to assist in our review.

Nesting Sea Turtles, Piping Plover, Choctawhatchee Beach Mouse and St. Andrew Beach Mouse
The Service has regulatory responsibility for nesting sea turtles (loggerhead, green, leatherback, and Kemp's ridley) while on land in Gulf and Bay counties. Effects on the five species of sea turtles in-water should be coordinated with the National Oceanic and Atmospheric Administration (NOAA), Southeast Regional Office, 9721 Executive Center Drive North, St. Petersburg, Florida 33702 (Tel: 727/570-5517).

One purpose of the GCP is to enhance economic development and provide direct access to tourist destinations in south Gulf County. While the proposed alternatives do not directly impact coastal beaches, they may indirectly and cumulatively affect coastal threatened and endangered species by encouraging development and increasing recreational use of coastal resources. The GCP Indirect and Cumulative Effects Report shows no impact from the Build Alternatives and 501 acres of coastal impacts from the No Build Alternative. It seems unlikely that the Build Alternatives – as a major new coastal connector – would have no effect on coastal growth. For example, one area of forecasted growth located west of Mexico Beach extends from US 98 to Alternative Alignments 17 and 19, suggesting an influence on that location's growth. It appears that all potential alternatives may have a role in facilitating growth and associated habitat losses. Increased tourism with added recreational use of Shell Island, Crooked Island, and East Crooked Island may also adversely affect listed species.

These potential indirect effects should be considered in the ESBA for coastal species including sea turtles, wintering piping plover, the Choctawhatchee beach mouse, and St. Andrew beach mouse. In consideration of the potential risk of secondary effects impacting coastal habitat, it is unlikely that the proposed project has No Effect on the Choctawhatchee beach mouse and St. Andrew beach mouse. Table 8.2 indicates a No Effect determination for the piping plover. This should be corrected to be consistent with text that concludes the project may affect, but is NLAA the piping plover.

The ESBA provides a potential commitment to "use sea turtle-friendly lighting strategies on bridges, if deemed necessary". It's unclear if lighting is being planned for other typical sections of the roadway. New lighting associated with the alternatives may indirectly affect nesting sea turtles and other coastal species by adding sky glow visible from the shore, even when the alternatives are not immediately adjacent to the beach. Features such as full cut-off fixtures with HPS lamps can be very effective in reducing sky glow from nearby connector roads. To avoid and minimize impacts to sea turtles and other coastal wildlife, we recommend a commitment to either add no new roadway lighting where it previously does not exist, or to work with the

Service to develop a wildlife-friendly lighting plan for any roadway lights potentially visible from the beach.

West Indian Manatee

The Service could concur with your determination that the proposed work may affect, but is NLAA the West Indian manatee with incorporation of *Standard Manatee Conditions for In-water Work* for bridge construction (enclosed).

Red-cockaded Woodpecker

Additional information is needed before the Service can concur with your effect determination for the red-cockaded woodpecker (RCW). This information could be provided once a preferred alternative is selected. The ESBA evaluation is based on a desktop analysis of two known populations at the Wetappo Creek Conservation Area (Wetappo) and Lathrop Bayou Tract (Lathrop), and their proximity to the proposed alternatives. However, additional habitat for RCW may be present within the alternatives' footprint. Indirect effects of the roadway also should be assessed. Indirect effects may include a reduced ability to manage existing RCW tracts by prescribed burning and a loss of habitat connectivity between the two known populations.

As indicated in our 2007 ETDM comments, field surveys for RCW nesting and foraging habitat should be done wherever suitable habitat is present. Aerial photography and coordination with landowners could assist in determining whether suitable habitat is present. Suitable nesting habitat is defined as pine, pine/hardwood, and hardwood/pine stands that contain pines 60 years in age or older. Suitable foraging habitat is defined as a pine or pine/hardwood stands of forest, woodland, or savannah in which 50 percent or more of the dominant trees are pines and the dominant pine trees are generally 30 years in age or older. If no suitable nesting or foraging habitat is present within the project impact area, then the project will have no direct effects to the RCW. If no suitable nesting habitat is present within the project impact area, but suitable foraging habitat is present and will be impacted, potential use of this foraging habitat by groups outside the project boundaries must be determined. This is done by identifying any potential nesting habitat within 0.5 mile of the suitable foraging habitat that would be impacted by the project. Any potential nesting habitat is then surveyed for cavity trees. If no active clusters are found, then the project will not directly affect the RCW. If one or more active clusters are found, a foraging habitat analysis is conducted to determine whether sufficient amounts of foraging habitat will remain for each group post-project. More detail on the RCW survey protocol is available in Appendix 4 of the recovery plan for the red-cockaded woodpecker.

In our 2007 ETDM comments, the Service indicated one long-term regional goal was to provide habitat connectivity between the two RCW populations at Wetappo and Lathrop. The 2007 FDOT Dispute Resolution Wildlife and Habitat Action Plan stated the analysis of potential impacts on listed species and habitats would include an evaluation of the connectivity between related populations and the potential for fragmentation of habitats. This analysis should be included in the ESBA for RCW. Only Alternatives 17 and 19 avoid fragmenting the habitat corridors between the Wetappo and Lathrop tracts. For the remaining alternatives, mitigation measures should be considered to protect habitat along the Wetappo Creek and Little Sandy Creek riparian corridors.

Listed Plants

Preliminary plant surveys identified three listed plant species associated with the Alternative Alignments and their 300-foot Buffer: white birds-in-a-nest (*Macbridea alba*)(Alternative Alignments 8/14/15), Godfrey's butterwort (*Pinguicula ionantha*)(Alternative Alignments 8/17 Buffer), and Florida skullcap (*Scutellaria floridana*)(Alternative Alignments 8/14/15 and Buffers). As indicated in the ESBA, additional seasonally-appropriate surveys for listed plants may be warranted for the preferred alternative. The Service agrees that additional comprehensive plant surveys are needed once the preferred alternative has been selected. Results should be provided in a report with maps that gives the methodology used, calendar date of surveys, plant locations, number of plants observed, and location of survey transects. The secondary and cumulative impacts to federally protected and other rare plants should also be assessed. Future growth target areas identified by the Delphi Group along Wetappo Creek could impact locations known to provide habitat for the 21 most imperiled plants in Northwest Florida. Consideration should be given to protecting these important areas for plants as you begin mitigation planning for this project. Strategic mitigation can be an effective tool in addressing the direct, indirect, and cumulative effects of a new roadway in a watershed with minimal development impacts.

The Service recommends modifying the plant conservation measure to read: "Impacts to listed plants should be avoided and minimized to the extent practicable". If the project has unavoidable impacts to listed plants, section 7(a)(2) of the Act requires federal agencies to formally consult with the Service to ensure that actions they authorize, fund, or carry out do not jeopardize the continued existence of threatened and endangered species.

Panama City Crayfish

The Service considers the state-listed Panama City crayfish (PCC) to be a "species of special concern." While this designation provides no regulatory protection under the Act, the Service is currently reviewing a petition for listing the PCC. Habitat loss and degradation are considered the greatest threats to its future survival. Our office is working in partnership with the Florida Fish and Wildlife Conservation Commission (FWC) and a private landowner on a Candidate Conservation Agreement with Assurances (CCAA) to protect and manage habitat for the PCC. Measures to protect the PCC and proactively address threats may help avoid the need for future federal listing.

The ESBA estimates that the western portion of all five alternatives may impact 124.3 acres of PCC core and secondary soils. FWC data identified multiple PCC occurrences along Star Avenue and Tram Road, locations known for their high density of PCC. You have indicated that coordination will take place with the FWC and site-specific surveys will likely be required for the preferred alternative. Your conclusion that the proposed project may affect, but is NLAA the PCC is not supported by the information provided in the ESBA. The draft Panama City Crayfish Management Plan (2007) indicates that an FWC Incidental Take Permit will be needed for activities that result in take of the PCC or its habitat. To address the potential direct and indirect habitat losses consistent with the draft plan, mitigation for loss of PCC habitat should be provided at a ratio that demonstrates a net benefit to the species. For example, mitigation at a

Mr. Brandon Bruner

6

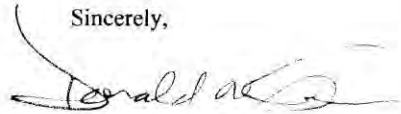
ratio of 2:1 where one acre of PCC habitat loss is offset with two acres of PCC habitat restored, would provide an overall benefit to the species.

Wood Stork

The FDOT has determined that the proposed alternatives will have "no effect" on the wood stork. However, the ESBA indicates that there is potential wood stork habitat within the GCP study area. While the nearest nesting colonies are in Leon County, Florida, wood storks may occur wherever suitable habitat is present. They sometimes forage and roost well beyond known nesting locations. For example, wood storks are routinely sighted on Northwest Florida Water Management District's wetland restoration sites in Washington and Santa Rosa counties. Since occurrences are rare in Gulf and Bay counties, the effects of the work are likely to be insignificant (too small to measure) and discountable (extremely unlikely to occur). Therefore, the Service could concur with a determination that the proposed alternatives may affect, but are NLAA the wood stork.

We appreciate the opportunity to provide comments. We look forward to working with you as we continue informal consultation on this project. Please contact Ms. Mary Mittiga (ext. 236) if you have any questions or comments.

Sincerely,



Dr. Donald W. Imm
Project Leader

Literature Cited

Florida Fish and Wildlife Conservation Commission. 2007 draft. Draft Panama City Crayfish Management Plan, Draft 2. Tallahassee, Florida. 50 pp. and appendices.

Enclosures:

Sturgeon Protection Guidelines
Standard Protection Measures for the Eastern Indigo Snake
Standard Manatee Conditions for In-water Work

cc: (without enclosures)

ACOE, Cocoa, FL (Andrew Phillips)
ACOE, Jacksonville, FL (Randy Turner)
FWCC, Tallahassee, FL (Scott Sanders, Ted Hoehn)
FWCC, Panama City, FL (John Himes)
NMFS, St. Petersburg, FL (Dave Rydene)

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK
2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

- a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
- b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or in Vero Beach (1-772-562-3909) for south Florida, and emailed to FWC at ImperiledSpecies@myFWC.com.
- f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8½" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at http://www.myfwc.com/WILDLIFEHABITATS/manatee_sign_vendors.htm. Questions concerning these signs can be forwarded to the email address listed above.

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

1. An eastern indigo snake protection/education plan shall be developed by the applicant or requestor for all construction personnel to follow. The plan shall be provided to the Service for review and approval at least 30 days prior to any clearing activities. The educational materials for the plan may consist of a combination of posters, videos, pamphlets, and lectures (*e.g.*, an observer trained to identify eastern indigo snakes could use the protection/education plan to instruct construction personnel before any clearing activities occur). Informational signs should be posted throughout the construction site and along any proposed access road to contain the following information:
 - a. a description of the eastern indigo snake, its habits, and protection under Federal Law;
 - b. instructions not to injure, harm, harass or kill this species;
 - c. directions to cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site on its own before resuming clearing; and,
 - d. telephone numbers of pertinent agencies to be contacted if a dead eastern indigo snake is encountered. The dead specimen should be thoroughly soaked in water and then frozen.
2. If not currently authorized through an Incidental Take Statement in association with a Biological Opinion, only individuals who have been either authorized by a section 10(a)(1)(A) permit issued by the Service, or by the State of Florida through the Florida Fish Wildlife Conservation Commission (FWC) for such activities, are permitted to come in contact with an eastern indigo snake.
3. An eastern indigo snake monitoring report must be submitted to the appropriate Florida Field Office within 60 days of the conclusion of clearing phases. The report should be submitted whether or not eastern indigo snakes are observed. The report should contain the following information:
 - a. any sightings of eastern indigo snakes and
 - b. other obligations required by the Florida Fish and Wildlife Conservation Commission, as stipulated in the permit.

Revised February 12, 2004

CONSTRUCTION SPECIAL PROVISIONS
STURGEON PROTECTION GUIDELINES
(PURSUANT TO NMFS AND USFWS)

The shortnose sturgeon (*Acipenser brevirostrum*) and the gulf sturgeon (*A. oxyrinchus desotoi*) are listed under the Endangered Species Act as endangered and threatened, respectively. These species are under the jurisdiction of the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). Potential habitat for the gulf sturgeon is located within the limits of this project.

The following special provisions will be incorporated into any construction contract where involvement with sturgeon may occur:

The FDOT has coordinated with the NMFS and USFWS early in the project development stage. The following provisions are intended to avoid/ protect known spawning habitats, nursery areas, feeding areas and thermal refuges.

1. The Florida Department of Transportation (FDOT) shall advise all FDOT project personnel and Contractor personnel on the project that there are civil and criminal penalties for harming, harassing or killing sturgeon, which are protected under the Endangered Species Act of 1973. The FDOT and the Contractor will be held responsible for any sturgeon harmed, harassed, or killed as a result of the project activity.
2. The FDOT shall provide information to all FDOT and Contract personnel for identification of sturgeon.
3. No dredging of the river bottom will be conducted for barge access.
4. Drilled shaft pile construction will be used whenever prudent and feasible as determined by FDOT.
5. Care shall be taken in lowering equipment or material below the water surface and into the stream bed. These precautions will be taken to ensure no harm occurs to any sturgeon which may enter the construction area undetected.
6. If the use of explosives is necessary, the following protection measures will be employed for projects in FDOT's District 3.

In riverine areas:

- No blasting will occur in known spawning, staging, feeding, or nursery areas.
- In-water explosive work should be avoided between the months of April to October.
- If explosive work becomes necessary within the April to October time frame, a non-lethal "Fish Scare" charge will be detonated one minute prior to detonation of the underwater blast.

In estuarine areas:

- No blasting will occur in known spawning, staging, feeding, or nursery areas.
- In-water explosive work should be avoided between the months of October to April.
- If explosive work becomes necessary within the October to April time frame, a non-lethal "Fish Scare" charge will be detonated one minute prior to detonation of the underwater blast.



Florida Department of Transportation

RICK SCOTT
GOVERNOR

1074 Highway 90
Chipley, Florida 32428

OFFICE OF THE
SECRETARY

Dr. Donald W. Imm
US Fish and Wildlife Service
1601 Balboa Avenue
Panama City, Florida 32405-3721

Re: Re: Gulf Coast Parkway
FPID #: 410981-2-28-01
County: Bay, Calhoun and Gulf
Endangered Species Biological Assessment Report

Dear Dr. Imm

Thank you for your comments on the Endangered Species Biological Assessment Report (ESBAR) for the above referenced project. The Service (USFWS) has indicated that they cannot concur with our effect determinations until the preferred alignment is selected and commitments for protection measures are finalized and submitted comments to assist in finalizing the ESBAR and resolving the Potential Dispute.

The following presents our proposed responses to those comments:

General Comments

Comment: As indicated in the ESBA, no gulf sturgeon critical habitat has been designated within the GCP study area, including East Bay. However, the Service biologists have noted the occasional occurrence of Gulf sturgeon within the St. Andrew Bay system. The Service recommends incorporating *Construction Special Provisions Sturgeon Protection Guidelines* during construction activities to assure impacts to the Gulf sturgeon are avoided and minimized to the greatest extent practical (enclosed). Provided that these measures are included in the final EIS, the Service could concur that the proposed work may affect, but is not likely to adversely affect (NLAA) the Gulf sturgeon.

Response: The ESBAR and DEIS will be revised to include text amendments to include a commitment to incorporating *Construction Special Provisions Sturgeon Protection Guidelines* and to modify the finding to MANLAA.

Comment: The Service could concur with your determination that the proposed work may affect, but is NLAA the Eastern indigo snake with incorporation of *Standard Protection Measures for the Eastern Indigo Snake* during construction.

Response: A commitment to include the *Standard Protection Measures for the Eastern Indigo Snake* during construction will be provided in the ESBAR and DEIS.

Comment: The ESBA uses a Phase I desktop habitat evaluation model to identify potential flatwoods salamander breeding pond across the five alternatives. The report separates involvement into direct (within the alignment) and indirect (within 1,500 feet of the alignment) impacts to breeding ponds. As you are aware, habitat for the reticulated flatwoods salamander has three components: the breeding pond, ecotone, and upland. Upland habitat extends up to 1,500 feet from the edge of a breeding pond. Therefore, upland habitat for the flatwoods salamander could be directly impacted if suitable ponds are located within 1,500 of the alignment. Potential breeding ponds are identified for all five alternatives. While the ESBA notes overall poor flatwoods salamander habitat conditions during limited wetlands surveys, more detailed information is needed before the Service can provide concurrence with your determination. We recommend completing a Phase II field evaluation of all potential ponds once a preferred alternative is selected. Your effect determination should be based on the Phase II evaluation. Score sheets, aerial maps, and site photos should be provided to the Service to assist in our review.

Response: Given the number of corridors and alignments considered and assessed for this project, along with the length of each typical alternative, e.g. \pm 30 miles, RFS assessments using the HDR method were limited to Phase I for all potential ponds within 1,500 feet of said alternatives. In light of this, FDOT agrees to conduct a Phase II RFS field evaluation for a representative sample of potential ponds within 1,500 feet of the preferred alternative during design and permitting. A re-assessment of the determination of effect for the preferred alternative will be based on the results of the Phase II field evaluation and has been added as a commitment in the ESBAR. FDOT's determination of effect for the RFS – as it relates to the project itself – has been changed in the ESBAR to "MANLAA".

Comment: The Service has regulatory responsibility for nesting sea turtles (loggerhead, green, leatherback, and Kemp's ridley) while on land in Gulf and Bay counties. Effects on the five species of sea turtles in-water should be coordinated with the National Oceanic and Atmospheric Administration (NOAA).

One purpose of the GCP is to enhance economic development and provide direct access to tourist destinations in south Gulf County. While the proposed alternatives do not directly impact coastal beaches, they may indirectly and cumulatively affect coastal threatened and endangered species by encouraging development and increasing recreational use of coastal resources. The GCP Indirect and Cumulative Effects Report shows no impact from the Build Alternatives and 501 acres of coastal impacts from the No Build Alternative. It seems unlikely that the Build Alternatives – as a major new coastal connector – would have no effect on coastal growth. For example, one area of forecasted growth located west of Mexico Beach extends from US 98 to Alternative Alignments 17 and 19, suggesting an influence on that location's growth. It appears that all potential alternatives may have a role in facilitating growth and associated habitat losses. Increased tourism with added recreational use of Shell Island, Crooked Island, and East Crooked Island may also adversely affect listed species.

These potential indirect effects should be considered in the ESBA for coastal species including sea turtles, wintering piping plover, the Choctawhatchee beach mouse, and St. Andrews beach mouse. In consideration of the potential risk of secondary effects impacting coastal habitat, it is unlikely that the proposed project has No Effect on the Choctawhatchee beach mouse and St. Andrew beach mouse. Table 8.2 indicates a No Effect determination for the piping plover. This should be corrected to be consistent with text that concludes the project may affect, but is NLAA the piping plover.

The ESBA provides a potential commitment to “use sea-turtle friendly lighting strategies on bridges, if deemed necessary”. It’s unclear if lighting is being planned for other typical sections of the roadway. New lighting associated with the alternatives may indirectly affect nesting sea turtles and other coastal species by adding sky glow visible from the shore, even when the alternatives are not immediately adjacent to the beach. Features such as full cut-off fixtures with HPS lamps can be very effective in reducing sky glow from nearby connector roads. To avoid and minimize impacts to sea turtles and other coastal wildlife, we recommend a commitment to either add no new roadway lighting where it previously does not exist, or to work with the Service to develop a wildlife-friendly lighting plan for any roadway lights potentially visible from the beach.

Response: The effects of the project on sea turtles in-water will be coordinated with NOAA.

As stated in the ESBAR: Potential habitat for beach mice is located south of US 98. The proposed southern termini for all Alternative Alignments are located north of US 98. None of the Alternative Alignments (proposed right-of-way and associated 300-foot buffers) will involve beach mice, potential habitat, or critical habitat. While platted developments located with the study area contain potential beach mouse habitat, each has existing conservation plans to address potential impacts (See ICE Report in EIS). Therefore, FDOT concludes that the subject project will have no effect on either the federally-endangered Choctawhatchee beach mouse or the St. Andrews beach mouse.

The effects on the beach mouse habitat shown in the ICE Report were in error. The 501 acres should have been 53.8 acres. The 53.8 acres of habitat impacts are from the Bon Fire and WindMark developments. These developments already have mitigation plans established.

There is no need to update Table 8.2 since piping plover is MANLAA for Alternatives 17 and 19 only. This, therefore, results in an overall determination of effect of MANLAA.

FDOT will commit to working with USFWS on a wildlife-friendly lighting plan in the event lighting becomes a part of the project during design.

Comment: The Service could concur with your determination that the proposed work may affect, but is NLAA the West Indian manatee with incorporation of *Standard Manatee Conditions for In-water Work* for bridge construction.

Response: The *Standard Manatee Conditions for In-water Work* have been incorporated into the ESBAR and DEIS.

Comment: Additional information is needed before the service can concur with you effect determination for the red-cockaded woodpecker (RCW). This information could be provided once a preferred alternative is selected. The ESBA evaluation is based on a desktop analysis of two known populations at the Wetappo Creek Conservation Area (Wetappo) and Lathrop Bayou Track (Lathrop), and their proximity to the proposed alternatives. However, additional habitat for RCW may be present within the alternatives' footprint. Indirect effects of the roadway also should be assessed. Indirect effects may include a reduced ability to manage existing RCW tracts by prescribed burning and a loss of habitat connectivity between the two known populations.

As indicated in our 2007 ETDM comments, field surveys for RCW nesting and foraging habitat should be done wherever suitable habitat is present. Aerial photography and coordination with landowners could assist in determining whether suitable habitat is present. Suitable nesting habitat is defined as pine, pine/hardwood, and hardwood/pine stands that contain pines 60 years in age or older. Suitable foraging habitat is defined as a pine or pine/hardwood stands of forest, woodland, or savannah in which 50 percent or more of the dominant trees are pines and the dominant pine trees are generally 30 years in age or older. If no suitable nesting habitat is present within the project impact area, but suitable foraging habitat is present and will be impacted, potential use of this foraging habitat by groups outside the project boundaries must be determined. This is done by identifying any potential nesting habitat within 0.5 mile of the suitable foraging habitat that would be impacted by the project. Any potential nesting habitat is then surveyed for cavity trees. If no active clusters are found, then the project will not directly affect the RCW. If one or more active clusters are found, a foraging habitat analysis is conducted to determine whether sufficient amounts of foraging habitat will remain for each group post-project. More detail on the RCW survey protocol is available in Appendix 4 of the recovery plan for the red-cockaded woodpecker.

In our 2007 ETDM comments, the Service indicated one long-term goal was to provide habitat connectivity between the two RCW populations at Wetappo and Lathrop. The 2007 FDOT Dispute Resolution Wildlife and Habitat Action Plan stated the analysis of potential impacts on listed species and habitats would include an evaluation of the connectivity between related populations and the potential for fragmentation of habitats. This analysis should be included in the ESBA for RCW. Only Alternatives 17 and 19 avoid fragmenting the habitat corridors between the Wetappo and Lathrop tracts. For the remaining alternatives, mitigation measures should be considered to protect habitat along the Wetappo Creek and Little Sandy Creek riparian corridors.

Response:

RCW habitat evaluations were centered on aerial photo interpretation of known populations and their proximity to Alternative Alignments. Habitat conditions proximal to known RCW populations were noted during field surveys for wetlands and other listed species. Specific field surveys for RCWs or cavity trees were not conducted.

Two RCW populations are associated with the GCP study area: Lathrop Bayou Management Area (LBMA) is being protected and enhanced by Bureau of Land Management (BLM) and The St. Joe Company where a small population of RCWs is located on Raffield Island. LBMA is located at the east end of East Bay, between two GCP Alternative Alignments (17/19 and 8/14/15) and includes 539 acres of late-successional, longleaf pine flatwoods. Approximately 22 cavity trees have been identified in a cluster on Raffield Island with a total of five birds banded as of December 2002. Alternative Alignments 17/19 are located approximately 6,000' west of the LBMA RCW cluster. The Wetappo Creek Conservation Area (WCCA) is located on St. Joe property in north Gulf County, just west of Wewahatchka, off of SR 22. WCCA comprises approximately 1,500 acres of late-successional longleaf pine habitat and currently supports eight RCW clusters (population goal of 10 active clusters) (St. Joe 2007). Alternative Alignments 8/14/15 are located approximately 1 mile (5,280') west of the WCCA. The LBMA and WCCA RCW populations are threatened by small numbers of birds and genetic isolation. Plans to translocate birds from other RCW populations to

improve genetic diversity in both populations are included in the overall management plan for both properties (United States Department of Interior {USDOI}, 2003). Publically-available data does not indicate the presence of any other RCW groups other than the Wetappo Creek and Lathrop Bayou clusters.

In addition to these two RCW populations, two documented historic RCW cavity trees/ clusters (circa 1980) were identified by FNAI along SR 22 in Gulf County in the vicinity of Oliver's Creek near the junction of Alternative Alignments 17/19 and 8/14/15. Limited reconnaissance along this section of SR 22 along with desktop analyses indicated that these cavity trees are no longer present as the habitat is dominated by various planted pine stands approximately 10-25 years old.

RCW habitat typically consists of contiguous stands of longleaf, loblolly, slash, and/or pond pine ranging in age between 30-120 years old. Younger stands provide foraging habitat while older stands serve as potential sources of cavity trees. RCW clusters (aggregation of cavity trees) generally comprise about 10 acres. Associated foraging habitat to support RCW groups is contained within an adjacent area extending to 0.5 mile with most foraging habitat preferably found within 0.25 mile of the cluster (USFWS 2003). Extensive forested tracts characterized by planted pine stands dominate the landscape adjacent to the WCCA. LBMA is surrounded by East Bay on three sides and is adjacent to planted pine stands similar to those described above along its southeastern border. These planted pine stands are generally 10-25 years old and are overburdened with midstory shrubs which, results in a vegetation structure unfavorable to RCWs. Alternative Alignments are located well beyond the 0.5-mile RCW foraging territory boundary.

USFWS concerns about the potential for the Gulf Coast Parkway to fragment habitat that separates these two RCW populations have been considered. The St. Joe Company-BLM Memorandum of Understanding (MOU) addresses the management of both RCW populations. Nothing in the MOU indicates that these two populations are "connected". In fact, the Lathrop Bayou and Wetappo Creek RCW populations are located approximately eight miles (8) from each other. None of the alternatives would have an effect on the management of either RCW nesting and/or foraging habitat for both the Wetappo Creek or Lathrop Bayou RCW populations. In addition, the land between these two populations is predominantly forested (planted pine 10-25 years old – technically not even foraging habitat) and primarily, if not entirely, privately owned. While private landowners may choose to manage their land to benefit listed species, e.g., RCWs, they are not required to do so. Based on habitat conditions in the study area and biological requirements of the species, i.e., foraging territories extend out 0.5 mile from a cluster, potential direct or other effects related to "fragmentation" are not anticipated.

FDOT submits that an adequate assessment of the habitat conditions associated with alternative alignments and the overall habitat context of the study area has been conducted. In light of these findings, FDOT concludes that the subject project will have no effect on the federally-endangered RCW.

Comment: Preliminary plant surveys identified three listed plant species associated with the alternative Alignments and their 300-foot buffer: white birds-in-a-nest (*Macbridea Alba*) (Alternative 8/14/15), Godfrey's butterwort (*Pinguicula ionantha*) (Alternatives 8/17 buffer), and Florida skullcap (*Scutellaria floridana*) (Alternatives 8/14/15 and buffers). As indicated in the ESBA, additional seasonally-appropriate surveys for listed plants may be warranted for the preferred alternative. The Service agrees that additional comprehensive surveys are needed once the preferred alternative has been selected. Results should be provided in a report with maps that gives the methodology used, calendar date of surveys, plant locations, number of plants observed, and location of survey transects. The secondary and cumulative impacts to federally protected and other rare plants should also be assessed. Future growth target areas identified by the Delphi Group along Wetappo Creek could impact locations known to provide habitat for the 21 most imperiled plants in Northwest Florida. Consideration should be given to protecting these important areas for plants as you begin mitigation planning for this project. Strategic mitigation can be an effective tool in addressing the direct, indirect, and cumulative effects of a new roadway in a watershed with minimal development impacts.

The Service recommends modifying the plant conservation measure to read: "Impacts to listed plants should be avoided and minimized to the extent practicable". If the project has unavoidable impacts to listed plants, Section 7(a)(2) of the Act requires federal agencies to formally consult with the Service to ensure that actions they authorize, fund, or carry out do not jeopardize the continued existence of threatened and endangered species.

Response: A 2001 report by The Nature Conservancy (TNC) and Florida Natural Areas Inventory (FNAI) identified 21 plant species in northwest Florida, that in their opinion, are in need of protection due to being rare and in danger of being extirpated due to being on private lands. Shapefiles were provided with the report that identified three areas on private lands in the study area that support rare communities including: Ridges of Gulf County (9,825 acres); Wetappo Creek South (3,543 acres), and Sandy Creek Bogs (6,998 acres). As described in the ESBA, the initial desktop evaluation included data from the most current FNAI report (2007) for the area. As the PD&E study progressed and field surveys were conducted across various alignments, proposed alignment footprints changed several times to address a variety of different potential impacts including those to listed species actually observed in the field. The results of the data synthesis and field reconnaissance indicated that listed plant species occurrences within the respective alignments and buffers and potential involvement was minimal.

The above referenced areas harboring rare plant communities were avoided to the greatest extent practicable during the PD&E stage of this project. The Ridges of Gulf County has been completely avoided. The majority of potential involvement with Sandy Creek Bogs and Wetappo Creek South are associated with existing paved highways, SR 22 and CR 386, respectively. Of the "21 most imperiled species" identified by FNAI and TNC, only 4 species are located within the "3 Rare Plant Areas" and 3 of these species are state listed (*Aster spinulosus* – currently *Eurybia spinulosus*, *Eriocaulon nigrobactatum*, and *Xyris isoetifolia*). The only federally-listed plant is Florida skullcap, which is found 4 miles east of Alternative Alignment 8/14/15. The "TNC-FNAI 21 species report" was developed at a coarse scale for the entire panhandle (Jefferson County to Alabama). Surveys conducted by project biologists were more current and thorough, as was the project-specific FNAI Report.

As is the case with all FDOT projects, listed and even rare (un-listed species) will be avoided and impacts minimized to the extent practicable. Depending on the alternative selected, it is

possible that there may be very minimal involvement with the areas identified as having rare species. Once a preferred alternative is selected supplemental seasonal surveys are anticipated to determine accurate and current impacts to listed species.

The plant conservation measure in the ESBA has been modified as requested.

Comment: The service considers the state-listed Panama City crayfish (PCC) to be a “species of special concern”. While this designation provides no regulatory protection under the Act, the Service is currently reviewing a petition for listing the PCC. Habitat loss and degradation are considered the greatest threats to its future survival. Our office is working in partnership with the FFWCC and a private landowner on a Candidate Conservation Agreement with Assurances (CCAA) to protect and manage habitat for the PCC. Measures to protect the PCC and proactively address threats may help avoid the need for future federal listing.

The ESBA estimates that the western portion of all five alternatives may impact 124.3 acres of PCC core and secondary soils. FWC data identified multiple PCC occurrences along Star Avenue and Tram Road, locations known for their high density of PCC. You have indicated that coordination will take place with the FWC and site-specific surveys will likely be required for the preferred alternative. Your conclusion that the proposed project may affect, but is NLAA the PCC is not supported by the information provided in the ESBA. The draft Panama City Crayfish Management Plan (2007) indicates that an FWC Incidental Take Permit will be needed for activities that result in take of the PCC or its habitat. To address the potential direct and indirect habitat losses consistent with the draft plan, mitigation for loss of PCC habitat should be provided at a ratio that demonstrates a net benefit to the species. For example, mitigation at a ratio of 2:1 where one acre of PCC habitat loss is offset with two acres of PCC habitat restored, would provide an overall benefit to the species.

Response: The USFWS did not finalize the CCAA with the private landowner and it is currently not being considered as necessary.

The Panama City Crayfish Management Plan (2007) is still a draft. Any potential mitigation requirements or a state-issued incidental take permit will be addressed by the project sponsor and the FFWCC during design and permitting. According to the FFWCC website (accessed on October 16, 2012) <http://myfwc.com/wildlifehabitats/imperiled/listing-process/> the draft management plan for the Panama City crayfish will be finalized by spring 2013. Based on this information and the status of the species, FDOT still concludes that this project is MANLAA for the Panama City crayfish.

Potential conservation measures for this state-listed species will be addressed by the project sponsor and FFWCC.

Comment: The FDOT has determined that the proposed alternatives will have “no effect” on the wood stork. However, the ESBA indicates that there is potential wood stork habitat within the GCP study area. While the nearest nesting colonies are in Leon County, Florida, wood storks may occur wherever suitable habitat is present. They sometimes forage and roost well beyond known nesting locations. For example, wood storks are routinely sighted on NFWFMD wetland restoration sites in Washington and Santa Rosa counties. Since occurrences are rare in Gulf and Bay Counties, the effects of the work are likely to be insignificant (too small to measure) and discountable (extremely unlikely to occur). Therefore, the Service could concur with a determination that the proposed alternatives may affect, but are NLAA the wood stork.

Response: Based on the data collected and reviewed for the ESBAR, the distance to the closest CFA (~50 miles to the east), the fact that any wood storks observed in this area would be considered “transient”, and that USFWS concurred with a “no effect” determination for the nearby West Bay Parkway Segments 1 and 2 in Bay County (very similar habitat conditions and landscape features), FDOT concludes that this project will have “no effect” on wood storks.

Sincerely,

A handwritten signature in blue ink, appearing to read "Alan Vann". The signature is fluid and cursive, with the first name "Alan" and last name "Vann" clearly distinguishable.

Alan Vann

**5/25/11 National Marine Fisheries Service Comment Letter
FDOT Response Letter**

From: David Rydene [mailto:David.Rydene@noaa.gov]
Sent: Wednesday, May 25, 2011 9:55 AM
To: Vann, Alan
Subject: NMFS comments on the Gulf Coast Parkway DEIS

NOAA's National Marine Fisheries Service offers the following comments regarding the Gulf Coast Parkway's Draft Environmental Impact Statement:

It was surprising that a preferred alternative was not named in the DEIS. The CEQ NEPA regulations (40 CFR 1502.14) state that the lead agency should "identify the agency's preferred alternative or alternatives, if one exists, in the draft statement". If a preferred alternative is not identified until the FEIS, then it will be difficult for the public and the resource agencies to provide input on the preferred alternative that is chosen. However, based on a conversation with Alan Vann, there will be opportunities for comments regarding the preferred alternative during the FEIS phase.

In regards to the selection of a preferred alternative, the original and primary purpose of the Gulf Coast Parkway (GCP) was to help stimulate Gulf County's depressed economy. It would seem that Alternatives 17 and 19 would do little to achieve this goal with the possible exception of Mexico Beach. If the GCP were built, the transfer of freight between Gulf County and Bay County, and the movement of Gulf County residents to employment centers in Bay County, would appear to send substantial truck and car traffic through Mexico Beach on US 98 when heading to the GCP. This would seem to be incompatible with Mexico Beach's tourism and retiree-based economy. In addition, Alternatives 17 and 19 would provide little benefit to the designated Enterprise Zones.

Another purpose for the GCP was to provide improved hurricane evacuation capability, in part because the high-level US 98 Dupont Bridge must be closed during high winds (over 55 mph). However, all of the proposed GCP alternatives also include a high-level bridge (see pg. 12). It would seem that any GCP bridge would also have to be closed during high winds, at least partially defeating the improved hurricane evacuation goal of the GCP.

Although a major purpose of the road is the stimulation of economic growth in the region, the indirect effects analysis indicates that the GCP will result in only minor growth over and above that which would occur under the No Build Alternative. There seems to be a logical disconnect in that regard.

The conclusions of the indirect effects analysis tend to finish with rationalizing statements in instances where it seems that a resource may be more than minimally impacted (e.g. regulations, permitting, or a potential conservation agreement will fix the problem). While these types of actions may

help to minimize development impacts to some extent, they do not eliminate those impacts, and there is also uncertainty with regards to their effectiveness that is not addressed.

Uncertainty also surrounds the results of the Delphi Group's analysis, and the whole indirect effects analysis hinges on the accuracy of those results.

Depending on which alternative is chosen, a bridge would be built to span either East Bay or Wetappo Creek. Under the essential fish habitat discussion, the potential direct effects of bridge construction are addressed, but the document does not consider impacts from the operation of a bridge once it is built. Effects such as the alteration of reproductive behavior of soniferous fishes and other estuarine species due to noise from bridge traffic or nighttime bridge lighting should be considered. NMFS would strongly recommend that any bridge built should be designed to convey stormwater off the bridge for treatment. If Alternative 17 or Alternative 19 is selected, before any actual East Bay Bridge construction begins, there should be a commitment made to conduct another seagrass survey during the June-August prime growing season.

On page 4-124 under Summary of Cumulative Effects Analysis, NMFS disagrees with the statement "In the case of new commercial areas, the high percentage is a benefit, not an adverse effect." New commercial areas may be beneficial in terms of economic development, but they are detrimental in other ways (e.g. habitat loss, pollutants). NMFS also disagrees with the statement "Potentially impaired waters and Class I drainage basins would probably benefit from future development, as it would be required to provide treatment of stormwater runoff that currently is draining untreated into these basins." While future developments may be required to treat stormwater, they will also introduce new contaminants that did not presently exist in undeveloped areas. It has not been NMFS' experience that increased development improves water quality.

Some editorial comments follow:

On page 4-6 in the bottom paragraph, the sentence "A negative number means the growth trend method predicted a larger population within the particular PARA than the Delphi Group." in reference to Table 4-5 appears incorrect. A negative number seems to indicate that the Delphi Group predicted a larger population in the PARA than the growth trend method.

On page 4-104 in the top paragraph, the sentence "The crossing of the ICWW would also provide the same horizontal clearance (50 feet) as the Du Pont Bridge.", should read 150 feet not 50 feet.

On page 4-130 under Commitment of Funds, the statement "The total commitment of funds for the proposed project is estimated to be 25 million dollars.",

needs to be clarified. The 25 million dollars obviously does not include construction costs, as according to Table 2-29 the total cost estimates for the GCP range between 540 and 619 million dollars.

Thank you for the opportunity to comment on the Gulf Coast Parkway DEIS.

--

David Rydene, Ph.D.
Fishery Biologist
National Marine Fisheries Service
Habitat Conservation Division
263 13th Avenue South
St. Petersburg, FL 33701
Office (727) 824-5379
Cell (727) 512-6782
Fax (727) 824-5300

This message has been checked for all known viruses by MessageLabs.

Dr. David Rydene, Ph.d.
Fishery Biologist
National Marine Fisheries Service
Habitat Conservation Division
263 13th Avenue South
St. Petersburg, Florida 33701

Re: Re: Gulf Coast Parkway
FPID #: 410981-2-28-01
County: Bay, Calhoun and Gulf
Draft Indirect and Cumulative Effects Report

Dear Dr. Rydene:

Thank you for your comments on the Draft Indirect and Cumulative Effects Report for the above referenced project. The following presents our proposed responses to those comments.

Comment: As with the Gulf Coast Parkway (GCP) DEIS, because no preferred alternative is identified, NMFS will be unable to provide comments regarding the preferred alternative selection until the FEIS stage. In general, the Indirect and Cumulative Effects Report seems to indicate that existence of the road will do little to induce growth over and above that which would occur under the No Build scenario. However, a primary purpose of the road is to enhance economic development in the region, particularly in Gulf County. If the road itself will do little to enhance economic development, it seems questionable to spend between 540 and 619 million dollars to build the road. In addition, two of the alternatives (17 and 19) may do little to help Gulf County's economic situation.

Response: The economic development activities envisioned as benefitting from the proposed project are principally tourism and its associated industries and freight transport. As these economic activities increase other economic benefits are expected to occur. All alternatives will benefit these economic activities. It is agreed that Alternatives 17 and 19 do not provide the same economic benefit to the enterprise areas in Gulf County as Alternatives 8, 14, and 15, but this is one of many factors to be weighed when determining a preferred alternative. Also, regarding the cost of the project, remember that the economic benefit to Gulf County is only one of several needs (discussed in Section 2 of the report) to be addressed by the proposed project.

Indirect Effects Analysis

Comment: As for the indirect effects analysis itself, the statement "These areas of induced growth have not been projected for growth by property owners, development corporations, planning officials, or others and do not represent a commitment that development will occur in those locations." on page 4-1 seems confusing. Why wasn't input from local property owners and developers used in the analysis to help determine the size and distribution of future development?

Response: It is agreed that the statement may be confusing, as input was provided from representatives of local property owners and developers through their participation in the Delphi Group. Therefore, this statement has been revised to say that "The areas

identified for induced growth do not reflect commitments on the part of property owners, development corporations, planning officials, or others that development will occur in those locations”.

Comment: On page 4-9 in the third full paragraph regarding the Delphi Group designating some conservation lands for development. Why weren't the conservation lands excluded from the Delphi Group's analysis in the first place?

Response: The conservation lands referred to in the text are privately-owned lands that have been identified for conservation or preservation on the County's future land use map and are not the same as lands under conservation easement or other formal arrangement. There are several categories of conservation land uses, some of which allow limited development; therefore, those “conservation” lands identified in the analysis were assigned population based on the densities allowed for the conservation category in which they fell. Also, Bay County land development regulations allow for the transfer of the land development rights of private property owners who have lands with a conservation land use. It would be beneficial to county planners to be aware of the potential necessity of providing transfer of development rights at some point in the future. Therefore, those privately owned lands with a conservation/preservation land use designation but no formal conservation agreement/easement (or public ownership) were included in the allocation of future population.

It should be noted that although the boundaries of a future development site may encroach on lands having a conservation land use designation, these lands may not actually be included in that future development but may be used for conservation to satisfy mitigation requirements. Without actual development plans for such properties, this possibility cannot, of course, be determined, which is why the analysis took the conservative approach and assumed everything within the boundaries of the future development would be developed.

Comment: Under Recreation Areas on page 4-17, wouldn't a bridge crossing East Bay be considered a negative impact on a recreation area (East Bay itself) that is regularly used by recreational boaters?

Response: The proposed high level bridge would be no more of a distraction to boaters than the Du Pont Bridge to the west and the Overstreet Bridge to the east.

Comment: Under Noise on page 4-17, there should be some discussion of the impacts of GCP and induced development-related noise on the fish and wildlife presently residing in those areas.

Response: The FHWA has reviewed numerous studies on the effect of road noise on various wildlife species. The FHWA has acknowledged that some species of wildlife may be affected by traffic noise levels but the evidence remains conflicting and incomplete. Given the complexity of the wildlife species environment, species mobility, variability in susceptibility to noise effects between species, and numerous other factors, there is still too little documentation on the subject to establish definitive relationships between traffic noise levels and wildlife species.

Comment: Under Air Quality on page 4-20, the statement “because the relative size of the induced growth population, compared to the overall future population, is so minor (approximately

10 percent of the total population growth)" needs clarification. At what point would induced growth be considered more than minor?

Response: Air quality impacts become substantial when the activities resulting from the future population growth creates emissions of pollutants at levels that result in air quality standards being approached or exceeded.

Comment: Under Essential Fish Habitat on pages 4-28 and 4-29, NMFS feels that although induced development may not have indirect effects on EFH simply from the construction of buildings and other structures, induced development may have adverse indirect impacts to EFH through avenues such as hydrologic alterations and degraded water quality.

Response: Comment noted. These impacts cannot be calculated since the exact location and nature of future development activities or any mitigation measures to be undertaken as a result of that development is not known.

Comment: On page 4-51, NMFS disagrees with the statement "Although the induced development would increase impervious surface within these drainage basins, development regulations and permitting requirements in these areas require treatment of waters prior to discharge; therefore, the indirect effects of the induced development within these drainage basins were not considered substantial, and potentially could be beneficial." Based on past experience development has not been beneficial to water quality.

Response: The statement "potentially could be beneficial" has been removed.

Comment: In Table 4-6 on page 4-52 the acreages of "impaired waters" watersheds impacted by No Build and Build development seem high enough for concern, given that these systems already have water quality issues.

Response: Comment noted.

Comment: The conclusions of the indirect effects analysis tend to finish with rationalizing statements in instances where it seems that a resource may be more than minimally impacted (e.g. regulations, permitting, or a potential conservation agreement will fix the problem). While these types of actions may help to minimize development impacts to some extent, they do not eliminate those impacts, and there is also uncertainty with regards to their effectiveness that is not addressed.

Response: There were only three resource categories in Table 4-6 (revised to Table 4-7) where the project alternatives' indirect involvement with the resource exceeded 1.9% of the total acres of the resource within the PARA. The three resource categories (and the percentage of impact or involvement with the resource) were new commercial areas (14.7 to 27.5%), potentially impaired waters (5.6%), and Panama city crayfish (3.8 to 5.0%). In the case of new commercial areas, the greater the involvement with the category the more beneficial the involvement is considered to be. Therefore, the high percentage of involvement is not an adverse effect.

The indirect involvement with the other two resource categories represented a negative effect; however, in both cases, avoidance, minimization and mitigation measures would reduce the potential estimated impact. In the case of the PCC, the PCC can be relocated and new habitat provided adjacent to existing habitat therefore, there would be little

threat to this unregulated species. In the case of potentially impaired waters, which may or may not be actually impaired, the avoidance, minimization and mitigation measures that would be required as part of the permit conditions should minimize the effects of the development in the 5.6% of the drainage basin of the potentially impaired waters sufficiently to not cause a substantial risk of the waters not meeting their criteria.

Therefore, given the relatively small percentage of involvement the resource (roughly 5% of the resources within their PARAs) and the implementation of avoidance, minimization and mitigation, the involvement was not deemed to be substantial.

Cumulative Effects Analysis

Comment: Although it is given some discussion in the Wetlands section (but not in Land Use), the principal human action altering natural resources within region was the conversion of pristine forested palustrine wetlands to silviculture lands fifty or more years ago. This conversion altered hydrology and degraded water quality and habitat suitability through activities such as the building of timber roads, the digging of drainage ditches, and fire suppression. However, I did not find any attempts to quantify these substantial past impacts (even at a crude level) in the analysis.

Response: Through our research of past data, it does not appear that there is sufficient information to make even a crude level quantification of this change. The concern then is that if an assessment is made it could provide inaccurate or misleading information that does not benefit the evaluation.

Comment: Under Wetlands on page 5-14, the statement "A mitigated involvement with 5.2 to 5.5 percent of all wetlands within the PARA is not considered substantial." At what point would it be considered substantial?

Response: No standard quantifiable measure that identifies a threshold at which wetland impacts are considered substantial, as is the case with air quality, has been determined by the resource agencies that oversee and manage wetlands. However, the determination that the wetland impacts, in this instance, were not substantial was based on three factors. First, the use of a very conservative approach for determining wetland impacts (i.e. ALL wetlands within the boundaries of the future development areas were considered impacted). Second, using this conservative approach only 5 to 5.5 percent of the total wetlands (regardless of wetland quality) in the PARA would be impacted, and third, avoidance, minimization, and mitigation measures would be required prior to permitting construction, further reducing the actual impact. So of the total wetlands identified within the Wetland PARA, and using an estimation of impacts that captures the worst case scenario (impacts of all wetlands within the boundaries of future developments) the total cumulative impact is about 5.5% of the available resource. Using currently accepted mitigation standards a greater percentage of wetlands would have to be put into conservation easements or mitigation banks (assuming about 2-3 acres of mitigation needed to offset every 1 acre of functional loss) in the Wetland PARA than would ultimately be impacted. Because of this, and because of the minor overall percentage, the cumulative impacts were not considered to be substantial.

Comment: Under Essential Fish Habitat, (as in the indirect effects analysis) there is no discussion of impacts to EFH and associated estuarine organisms from the operation of the bridge once

built (e.g. traffic noise disrupting spawning activities of soniferous fishes such as spotted seatrout or black drum, or bridge lighting affecting other estuarine species).

Response: It is acknowledged that in recent years research has begun to be conducted on the effects of noise on fish. However, the majority of that research appears to have been done on sea mammals and/or appears to be mostly on the effects of noise generated from the water's surface (boats) or within the water column (as opposed to sources from land which are subjected to defraction upon entry into water, although sonic booms have been noted to have effects). In addition there has not been enough research to separate the noise disturbance effects on fish from other modern stressors such as pollution and over-fishing. The FHWA has indicated that at this point in time the importance of road noise in affecting the behavior of fish populations, particularly in the relationship between road traffic noise levels and any response by fish is unknown.

To date, the requirement to analyze the effects of lighting is confined to sea turtle hatchlings and this has been addressed in the project's ESBA.

Comment: Under Water Quality, the beneficial effects of human development activities on water quality seems overly optimistic.

Response: The statement "potentially could be beneficial" has been removed.

Sincerely,



Alan Vann

**7/15/2011 US Corps of Engineers Comment Letter on DEIS, WER
and ICE Report**



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

July 15, 2011

North Permits Branch
SAJ-2009-02076 (IP-AWP)

Florida Department of Transportation – District 3
Attn: Alan Vann
1074 Highway 90
Chipley, Florida 32428

Dear Mr. Vann:

Reference is made to your February 2011 submittal of the Gulf Coast Parkway, Draft Environmental Impact Statement (EIS). The U.S. Army Corps of Engineers has completed its review of the draft EIS, Wetland Evaluation Report and Indirect and Cumulative Effects Report and does not have any comments to provide at this point in the DEIS process.

We appreciate the opportunity to review and comment on the documents and we are looking forward to working with you in the near future. If you have any questions regarding this letter, please contact Randy Turner at the letterhead address or by telephone at 904-232-1670.

Sincerely,

Randy L. Turner
Project Manager, Jacksonville
Permitting Section

**6/24/11 Northwest Florida Water Management District Comment
Letter
FDOT Response Letter**



Douglas E. Barr
Executive Director

Northwest Florida Water Management District

81 Water Management Drive, Havana, Florida 32333-4712

(U.S. Highway 90, 10 miles west of Tallahassee)

(850) 539-5999 • (Fax) 539-2777

MEMORANDUM

TO: Alan Vann, Project Coordinator, Florida Department of Transportation
Greg Garrett, Group Manager, Transportation Planning, Atkins

THROUGH: Duncan J. Cairns, Chief, Bureau of Environmental and Resource Planning

FROM: Paul Thorpe, Resource Planning Section Director

DATE: June 24, 2011

SUBJECT: Gulf Coast Parkway Preliminary Draft Environmental Impact Statement

The Gulf Coast Parkway would provide a major new highway corridor, combining development of new alignment sections with the widening and expansion of existing roadway segments in rural Gulf and Bay counties. District staff have participated in early review and technical assistance through the Efficient Transportation Decision-Making (ETDM) process. Detailed descriptions of resource concerns previously provided by the District during the ETDM process remain applicable. Following are technical comments and recommendations concerning the Preliminary Draft Environmental Impact Statement (EIS) transmitted by FDOT on April 20, 2011. Comments and recommendations concerning the Indirect and Cumulative Effects analysis were provided under separate cover on June 3, 2011.

Floodplains and Floodplain Functions

- Data shown on Figure 3-15 (section 3, page 3-54) appear to reflect old, no longer effective data from November 2002. Effective data, dated April 2009 is referenced in Table 3-23 (Section 3, page 3-53) but not reflected on the map. It is unclear whether the effective or old data were utilized in the quantitative analysis.
- Calhoun County flood information was included in the maps on page 3-54, but not referenced in Table 3-23 (FEMA Flood Insurance Rate Maps within the Study Area). Additionally, the data were not referenced in Table 3-24 (FEMA Flood Insurance Studies [FIS] within the Study Area). It is unclear whether the mapped data were considered in the tabulated analysis in Section 2, page 2-90 (Table 2-27, Natural Environmental Involvement Category Ranking). There appear to be no text references to the Calhoun County data within the Draft EIS. It is unclear whether impacts to floodplains in Calhoun County were evaluated.
- Section 3.6.5, Floodplains, states that the storm surge zones of East Bay have a base flood elevation of 8.0 feet, but data referenced in-house reflect storm surge elevations ranging from 8 to 11 feet. Storm surge zones near the project terminus are mapped as high as 16 feet, but no reference to this was found in the document.

GEORGE ROBERTS
Chair
Panama City

PHILIP K. McMILLAN
Vice Chair
Blountstown

STEVE GHAZVINI
Secretary/Treasurer
Tallahassee

PETER ANTONACCI
Tallahassee

STEPHANIE BLOYD
Panama City Beach

JOYCE ESTES
Eastpoint

TIM NORRIS
Santa Rosa Beach

JERRY PATE
Pensacola

RAPLH RISH
Port St. Joe

Water Quality

- It is recommended that the Chapter 4 of the DEIS include a discussion of likely or potential short-term and long-term water quality impacts that would result from construction and operation of a major roadway. Section 4.3.7 discussed water quality, but potential effects were not clearly identified. Pollutants and their potential effects should be identified, as well as the potential for stormwater treatment systems to minimize such effects. Long-term impacts, for example, would include nonpoint source discharge of pollutants, as well as disruption of adjacent wetland and floodplain water quality functions. Short term impacts would include discharge of sediments during construction, increased turbidity in the proximity of construction and downstream, with resulting impacts on benthic aquatic habitats. It would also be appropriate to identify specific stream crossings and proximate surface waters that would potentially be affected by both construction-related impacts and long-term operation. The EIS should also include an assessment of anticipated success of construction BMPs to control sedimentation and turbidity during possible major storm events, such as are not infrequent in the region.
- Section 4.3.7 of the DEIS appears to conclude that the no build alternative would result in greater water quality impacts than any of the build alternatives. The rationale given is that existing stormwater would continue to be untreated under the no-build alternative, while the build alternatives would all meet permitting requirements for treating runoff from the new construction. The given conclusion, however, would only seem valid to the degree that existing stormwater and nonpoint source pollution impacts (which are not otherwise detailed in the analysis) would also be corrected in the process of the new facility construction. In general, construction of new roadways, land disturbance, and impervious surface area would be expected to increase nonpoint source pollution (adding to the existing sources) unless significant existing problems are described and actions proposed to be taken to address the existing impacts are clearly articulated. Thus, it is recommended that the analysis and discussion reflected in this section of the report be reevaluated.

It would seem that the potential for individual build alternatives to correct existing stormwater and nonpoint issues would differ based how much each proposed alignment incorporates existing roadway corridors. An analysis of this, identifying the relative potential of each build alternative to address existing impacts would be appropriate. If this project does include, as a mitigating measure, the correction and retrofit of existing nonpoint sources, it would be well-worth describing this within the document. Paragraph seven on p. 4-74, however, indicates that no additional stormwater mitigation is being considered beyond meeting direct construction regulatory requirements.

District staff appreciate the opportunity to review the preliminary draft EIS and associated documents. If there are any questions concerning this review, please do not hesitate to contact Paul Thorpe or Duncan Cairns at (850) 539-5999.



Florida Department of Transportation

RICK SCOTT
GOVERNOR

1074 Highway 90
Chipley, Florida 32428

OFFICE OF THE
SECRETARY

Mr. Duncan Cairns, Chief
Bureau of Environmental and Resource Permitting
Northwest Florida Water Management District
81 Water Management Drive
Havana, Florida 32333-4712

Re: Gulf Coast Parkway
FPID #: 410981-2-28-01
County: Bay, Calhoun and Gulf
Preliminary Draft Environmental Impact Statement

Dear Mr. Cairns:

Thank you for your comments on the Preliminary Draft Environmental Impact Statement for the above referenced project. The following presents our proposed responses to those comments.

Floodplains and Floodplain Function

Comment: Data shown on Figure 3-15 (section 3-54) appear to reflect old, no longer effective data from November 2002. Effective data, dated April 2009 is referenced in Table 3-23 (Section 3, page 3-53) but not reflected on the map. It is unclear whether the effective or old data were utilized in the quantification analysis.

Response: The referenced date on Figure 3-15 was in error. The data utilized was the more recent April 2009. Therefore, the date on the figure has been changed.

Comment: Calhoun County flood information was included in the maps on page 3-54, but not referenced in Table 3-23 (FEMA Flood Insurance Studies [FIS] within the study area). It is unclear whether the mapped data were considered in the tabulated analysis in Section 2, page 2-90 (Table 2-27, Natural Environmental Involvement Category Ranking). There appear to be no text references to the Calhoun County data within the Draft EIS. It is unclear whether impacts to floodplains in Calhoun County were evaluated.

Response: The mapped data for Calhoun County was the 2009 DFIRM data. The FIS study for Calhoun County was not included in Table 3-23 because it was being revised and was not available at the time of the report.

Comment: Section 3.6.5, Floodplains, states that the storm surge zones of East Bay have a base flood elevation of 8.0 feet, but data referenced in-house reflect storm surge elevations ranging from 8 to 11 feet. Storm surge zones near the project terminus are mapped as high as 16 feet, but no reference to this was found in the document.

Response: The base flood elevation provided in the Location Hydraulic Report and the Draft EIS reflects the stillwater storm surge elevation of 8.0 feet (NAVD 88) in East Bay near the project alignment. There are higher elevations on the FIRM associated with wave height. The wave crest heights are estimated as elevation 9.0 feet (NAVD 88) in East Bay near the alignment. This difference is not significant and would not affect the selection of alternatives.

In the coastal area, at US 98, at the beginning of the project, there are also wave height elevations noted on the FIRM. The wave heights, including elevation 16 have flood zone limits associated with them. The limits stop on the dune system and are outside the project limits. At US 98 there is a very small Zone AE area identified with a Stillwater elevation of 12.0 feet. This area stops near the gulf side right-of-way of US 98 and will have no effect on the selection of alternatives.

Therefore, no change in the discussion of storm surge has been made.

Water Quality

Comment: It is recommended that the Chapter 4 of the DEIS include a discussion of likely or potential short-term and long-term water quality impacts that would result from construction and operation of a major roadway. Section 4.3.7 discussed water quality, but potential effects were not clearly identified. Pollutants and their potential effects should be identified, as well as the potential for stormwater treatment systems to minimize such effects. Long-term impacts, for example, would include nonpoint source discharge of pollutants, as well as disruption of adjacent wetland and floodplain water quality functions. Short term impacts would include discharge of sediments during construction, increased turbidity in the proximity of construction and downstream, with resulting impacts on benthic aquatic habitats. It would also be appropriate to identify specific stream crossings and proximate surface waters that would potentially be affected by both construction-related impacts and long-term operation. The EIS should also include an assessment of anticipated success of construction BMPs to control sedimentation and turbidity during possible major storm events, such as are not infrequent in the region.

Response: A discussion of pollutants in road run-off and their potential effects has been added to the discussion of water quality as has the identification of specific surface water crossings. Use of best management practices for short-term construction effects is addressed in Section 4.3.20 Construction.

Comment: Section 4.3.7 of the DEIS appears to conclude that the no build alternative would result in greater water quality impacts than any of the build alternatives. The rationale given is that existing stormwater would continue to be untreated under the no-build alternative, while the build alternatives would all meet permitting requirements for treating runoff from the new construction. The given conclusion, however, would only seem valid to the degree that existing stormwater and nonpoint source pollution impacts (which are not otherwise detailed in the analysis) would also be corrected in the process of the new facility construction. In general, construction of new roadways, land disturbance, and impervious surface area would be expected to increase nonpoint source pollution (adding to the existing sources) unless significant existing problems are described and actions proposed to be taken to address the existing impacts are clearly articulated. Thus, it is recommended that the analysis and discussion reflected in this section of the report be reevaluated.

Response: The sentence suggesting potential for improvement in water quality has been removed.

Comment: It would seem that the potential for individual build alternatives to correct existing stormwater and nonpoint issues would differ based how much each proposed alignment incorporates existing roadway corridors. An analysis of this, identifying the relative potential of each build alternative to address existing impacts would be appropriate. If this project does include, as a mitigating measure, the correction and retrofit of existing nonpoint sources, it would be well-worth describing this within the document. Paragraph seven on p. 4-74, however, indicates that no additional stormwater mitigation is being considered beyond meeting direct construction regulatory requirements.

Response: The amount (feet, miles) of existing paved and unpaved roads incorporated by each alternative has been included in the water quality discussion.

Sincerely,

A handwritten signature in blue ink, appearing to read "Alan Vann". The signature is fluid and cursive, with the first name "Alan" and last name "Vann" clearly distinguishable.

Alan Vann

**6/1/11 USFWS Comment Letter
FDOT Response Letter**



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Field Office

1601 Balboa Avenue

Panama City, FL 32405-3721

Tel: (850) 769-0552

Fax: (850) 763-2177

June 1, 2011

RECEIVED

JUN 8 2011

ENVIRONMENTAL MANAGEMENT
OFFICE

Mr. Brandon Bruner
District Project Development Engineer
Florida Department of Transportation
Post Office Box 607
Chipley, Florida 32428-0607

Attn: Mr. Alan Vann

Re: FWS No. 2011-I-0304
Florida Department of Transportation
Gulf Coast Parkway PD&E Study
Wetlands Evaluation Report
Indirect and Cumulative Effects Report
Draft Environmental Impact Statement
FPID #: 410981-2-28-01
Bay, Gulf, and Calhoun Counties, Florida

Dear Mr. Bruner:

Thank you for your letter to the Fish and Wildlife Service (Service) dated April 20, 2011, providing the above-referenced project reports for our review. The Endangered Species Biological Report (ESBA) was reviewed separately and comments were provided by this office in a letter dated May 20, 2011. This response is provided in accordance with provisions of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*), Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*), Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712), and the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4231 *et seq.*).

The Federal Highway Administration (FHWA) and Florida Department of Transportation (FDOT) propose to construct a new roadway – the Gulf Coast Parkway (GCP) – connecting US 98 in Gulf County to US 231 and US 98 in Bay County, Florida. Five Alternatives (8, 14, 15, 17, and 19) and a No-Build Alternative are being studied during the Project, Design, and Environment (PD&E) phase of the project. The Service is a cooperating agency on the Environmental Impact Statement (EIS). At this time, no preferred alternative has been identified.

The GCP is proposed as a four-lane divided roadway with both rural and urban sections. Within a 168-foot right-of-way (ROW), the typical urban section will include a 46-foot grassed median and the following in each direction: two 12-foot travel lanes; paved 4-foot inside and 6.5-foot outside shoulders; 5-foot sidewalks, and a closed curb-and-gutter drainage system with stormwater treatment. The typical rural section has a 250-foot ROW and will include a 64-foot grassed median and the following in each direction: two 12-foot travel lanes; paved 2-foot inside and 5-foot outside shoulders; and open drainage swales. A 12-foot shared use path will be located on one side of the roadway. Length varies from approximately 28 to 33 miles. All build alternatives include high level bridges either over Wetappo Creek and the Intra-coastal Waterway (ICWW) (Alternatives 8, 14, and 15) or over East Bay (Alternatives 17 and 19). Initially, only two 12-foot lanes within either typical section will be constructed. Design speed is 50 mph for the urban sections and 65 mph for the rural roadway.

Wetland Evaluation Report

The Service identified the GCP as a Potential Dispute during the 2007 Efficient Transportation Decision Making (ETDM) review process due to its high potential to have a significant direct, indirect, and cumulative impact on water resources that support numerous fish, wildlife, and plant species, including federally protected and other rare species. The FDOT developed a Wetlands Action Plan in 2007 to address agency concerns and resolve the Potential Dispute. After review of the Wetlands Evaluation Report, the following items warrant further discussion:

1. Some wetlands identified as low quality (page 5-10) may have a high potential for rare plant and wildlife habitat. The “openness” of maintained powerline easements can result in a diverse herbaceous layer in locations with remnant wet prairie. Ditches (510D), utility transmission lines (817W), and powerline easements (832W) may provide habitat for the Panama City crayfish (PCC) – a species of concern for the Service and a state-protected wildlife species. Within the range of the PCC, the Uniform Mitigation Assessment Method (UMAM) scores should be higher to reflect the potential for PCC occurrence in these wetland types.
2. In Section 7 (page 7-1), the report notes that regulatory agencies in Northwest Florida require an assessment of the indirect effects to wetlands within 300 feet of the alignment boundaries. The 300-foot secondary effect distance has routinely been used when evaluating wetland dredge-and-fill permits for the expansion of existing roadways. The secondary effects of a new roadway in a previously minimally-developed environment can be expected to have large-scale landscape effects by: facilitating habitat fragmentation; disrupting wildlife movement corridors; introducing roadside invasive and exotic species; and providing new points of human access. Such broad-scale effects can occur at distances of over 1000 meters from the road surface (Forman et. al. 2003). The Service recommends using a greater than 300-foot indirect effect distance for sections of the GCP that do not follow existing roadways. This should be part of the detailed and comprehensive assessment of indirect and cumulative wetland effects to be conducted after a preferred alignment is selected.

3. In Section 8 (page 8-1), FDOT indicates that wetland impacts will be mitigated using either Florida statute approved mitigation (373.4137 F.S.), mitigation banks, or property donations. The Service recommends developing a mitigation plan at the earliest time conceivable well in advance of the wetland dredge-and-fill permit application. A carefully-considered mitigation plan can be a valuable tool toward offsetting unavoidable wetland losses, meeting conservation goals, preventing "missed opportunities", and proactively addressing the threats of future secondary and cumulative growth.

We encourage taking a holistic approach to mitigation planning for the GCP that balances transportation needs, conservation priorities, and growth management concerns. Due to the potential for this new roadway to highly alter the surrounding landscape, mitigation for impacts should be strategically-located to protect important water/wetland resources and help achieve regional conservation objectives. A landscape planning effort using tools such as Strategic Conservation Planning Using a Green Infrastructure Approach, Sector Planning, or a Regional General Permit would assist in identifying conservation priorities while providing a mechanism to direct growth away from key resources at-risk. In November 2010, the Service hosted a local training on Green Infrastructure to familiarize our partners with its principles. The Service is available to work with FDOT and FHWA toward developing and implementing a regional Green Infrastructure Plan for the project area.

4. Measures to reduce the GCP's direct and indirect effects to wetlands (and the fish, wildlife, and plant resources they support) should be provided once a preferred alternative is determined. These commitments should include: environmentally-sensitive bridging of waters and high quality resources; protecting riparian corridors along Wetappo Creek and Little Sandy Creek to maintain connectivity between two populations of the red-cockaded woodpecker; acquisition and restoration of habitat for the PCC; reducing the project footprint in high quality habitat; stringent limited access; avoiding imperiled plants, including areas identified by the Nature Conservancy and Florida Natural Areas Inventory as important to the survival of the 21 most imperiled plant species in the Florida panhandle; provide wildlife crossings to reduce habitat fragmentation for the Florida black bear and other wide-ranging species; an erosion control plan to prevent degradation of downstream waters; water quality protection measures; post-project monitoring to identify and control invasive and exotic species; and measures to reduce impacts to migratory birds.
5. The Wetlands Action Plan indicated there would be agency coordination throughout the PD&E process. As indicated in Section 9, no coordination has taken place with the Service to discuss and resolve wetland concerns since 2007. We recommend periodic meetings to further progress toward resolving the Potential Dispute.

Indirect and Cumulative Impacts Report

The Service identified the GCP as a Potential Dispute during the 2007 review process due to its high potential to have significant secondary and cumulative impacts on wetlands, and wildlife

and their habitat. The FDOT developed an Indirect and Cumulative Effects Action Plan in 2007 to address agency concerns and resolve the Potential Dispute. Several interagency meetings have been held to discuss assessment approaches for determining secondary and cumulative effects. After review of the Indirect and Cumulative Effects Report, the Service has the following comments:

1. Table 5-18 indicates that 60.6% of the Potentially Affected Resource Area (PARA) for Water Quality is verified impaired waters. How was this calculation made, as only one basin (East Bay) in the referenced Florida Department of Environmental Protection 2006 Water Quality Assessment Report is identified as verified impaired? As Class II shellfish waters, this water body was determined to be verified impaired for fecal coliforms.
2. The report suggests that future development may provide beneficial effects to water quality in impaired basins through improved stormwater management. Additional support should be provided for this statement. Generally, stormwater treatment is designed to mitigate the effects of new development and does not provide overall watershed improvement, unless existing systems are being retrofitted.
3. Other metrics may be available to better identify potential future effects to water quality in the PARA. For example, studies have shown that water quality degradation can begin with as little as 10% impervious surface in a watershed (Schueler 1994; Schueler and Holland 2000; Arnold and Gibbons 1996). Determining the percent impervious surface of predicted future development within individual water bodies in the PARA may be a more useful tool in determining which water bodies are at-risk of future water quality degradation as an indirect and cumulative effect of the GCP.
4. The Delphi Group has indicated that none of the forecasted new coastal growth is associated with the Build Alternatives. It seems likely that the GCP – as a new coastal connector road – will have some degree of effect on coastal growth.
5. Page 4-33 indicates that any commensal species, including the Eastern indigo snake, captured during gopher tortoise relocation efforts, must be relocated to a certified gopher tortoise recipient site. The Service recommends that you first follow *Eastern Indigo Snake Standard Construction Conditions* and allow the snake sufficient time to move out of the construction area. If the snake must be moved, only personnel authorized under a U.S. Fish and Wildlife Service Section 10 permit may handle this federally protected species. A state gopher tortoise permit does not provide authorization for moving the Eastern indigo snake.
6. For the Florida black bear, the Service's greatest concern is the fragmentation of its habitat by a new future four-lane roadway. If the road becomes a barrier to movement, it could eliminate access to habitat. For example, bears in the Apalachicola population could lose all suitable habitat to the west of the road. Measures to offset fragmentation should be identified in the report. These measures may include construction of wildlife

crossings, reducing speed limits, prioritizing corridors that reduce east-west habitat fragmentation, and/or minimizing the overall footprint in high quality habitat areas.

7. On page 4-47, habitat for the red-cockaded woodpecker (RCW) is prioritized by nesting habitat (highest), foraging habitat, and a flight/dispersal corridor between the two known tracts (lowest). All these habitat types are priorities for the Panama City Field Office, and should be identified by function rather than an assigned relative importance. Measures to offset impacts to the flight corridor could include protection/management of suitable habitat within the corridor. Another potential secondary effect of the GCP is a reduced ability to manage existing RCW tracts by prescribed burning due to smoke management concerns. Other secondary effects in addition to new growth should be discussed in the report.
8. The RCW PARA should be the same as the Wildlife PARA, as RCW may potentially occur wherever suitable habitat is present and not just within known tracts.
9. Page 4-50 refers to a single 59-acre site for the "21 most imperiled species". It is unclear what site the document is referencing. The Service provided information to Greg Garrett, PBS&J, in a note dated October 16, 2009, on a 2001 report by The Nature Conservancy and Florida Natural Areas Inventory that identified areas important to the survival of the 21 most imperiled plant species in the Florida panhandle. A copy of the report and a geographic information system (GIS) shapefile were also provided at that time. Several of these important plant areas occur in the study area, including: Ridges of Gulf County (9,825 acres); Wetappo Creek South (3,543 acres), and Sandy Creek Bogs (6,998 acres). The Indirect and Cumulative Effects Report should be updated to accurately assess potential effects to the "21 most imperiled plant species".
10. Page 4-43 indicates that since the Florida Fish and Wildlife Conservation Commission (FWC) and Service are working on a Candidate Conservation Agreement with Assurances (CCAA) with a major private landowner to protect habitat for the Panama City crayfish (PCC) "it is assumed that a core population of PCC will be managed in perpetuity...Therefore, any induced development...was determined not to have a substantial adverse effect on the PCC". The intent of the CCAA, which has yet to be finalized, is to provide sufficient habitat to offset direct losses from projects sponsored by the landowner. Under the Build Alternative, the potential for 124.3 acres direct and 1,329 to 1,774 acres indirect loss of PCC habitat could have a substantial impact on the PCC. The Service is concerned that cumulative effects could impact up to 26.7 % of PCC habitat. The report should include commitments to address potential habitat loss consistent with the draft 2007 Panama City Crayfish Management Plan during the FWC incidental take permitting process.
11. On page 6-1, the list of Past, Present, and Reasonable Foreseeable Actions should also include: Gulf-to-Bay Highway Segments 1, 2, and 3; St. Joe Company WindMark Phase 1 and future phases; St. Joe Company RiverCamp on Sandy Creek; Biomass Gas and Electric Biofuels Facility; Port St. Joe port expansion; Bay Industrial Park; St. Joe

Mr. Brandon Bruner

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cc:

ACOE, Cocoa, FL (Andrew Phillips)
ACOE, Jacksonville, FL (Randy Turner)
FWCC, Tallahassee, FL (Scott Sanders, Ted Hoehn)
FWCC, Panama City, FL (John Himes)
NMFS, St. Petersburg, FL (Dave Rydene)



Florida Department of Transportation

RICK SCOTT
GOVERNOR

1074 Highway 90
Chipley, Florida 32428

OFFICE OF THE
SECRETARY

Dr. Donald W. Imm
US Fish and Wildlife Service
1601 Balboa Avenue
Panama City, Florida 32405-3721

Re: Re: Gulf Coast Parkway
FPID #: 410981-2-28-01
County: Bay, Calhoun and Gulf
Wetlands Evaluation Report
Indirect and Cumulative Effects Report
Draft Environmental Impact Statement

Dear Dr. Imm:

Thank you for your comments on the Wetlands Evaluation Report, Indirect and Cumulative Effects Report, and Draft Environmental Impact Statement for the above referenced project. The following presents our proposed responses to those comments.

Wetland Evaluation Report

Comment: Some wetlands identified as low quality (page 5-10) may have a high potential for rare plant and wildlife habitat. The "openness" of maintained powerline easements can result in a diverse herbaceous layer in locations with remnant wet prairie. Ditches (510D), utility transmission lines (817W), and powerline easements (832W) may provide habitat for the Panama City crayfish (PCC) – a species of concern for the Service and a state-protected wildlife species. Within the range of the PCC, the Uniform Mitigation Assessment Method (UMAM) scores should be higher to reflect the potential for PCC occurrence in these wetland types.

Response: Given the size, scope, number of alternative corridors, and number of alternative alignments considered for this project since 2003, UMAM scores were generalized for the various wetland habitats encountered. This level of detail is warranted and appropriate for PD&E studies. The assertion for "higher scores" in certain areas is taken under advisement and may prove to be true should this project go to permitting and wetland-specific UMAM scores are generated to support the overall assessment of wetland impacts via the ERP application process.

Comment: In Section 7 (page 7-1), the report notes that regulatory agencies in Northwest Florida require an assessment of the indirect effects to wetlands within 300 feet of the alignment boundaries. The 300-foot secondary effect distance has routinely been used when evaluating wetland dredge-and-fill permits for the expansion of existing roadways. The secondary effects of a

new roadway in a previously minimally-developed environment can be expected to have large-scale landscape effects by: facilitating habitat fragmentation; disrupting wildlife movement corridors; introducing roadside invasive and exotic species; and providing new points of human access. Such broad-scale effects can occur at distances of over 1000 meters from the road surface (Forman et. al. 2003). The Service recommends using a greater than 300-foot indirect effect distance for section of the GCP that do not follow existing roadways. This should be part of the detailed and comprehensive assessment of indirect and cumulative wetland effects to be conducted after a preferred alignment is selected.

Response: Additional assessments of indirect and cumulative wetland effects, i.e. beyond the 300-foot indirect effects distance, will be considered, as warranted (wouldn't be necessary in an area void of wetlands) for the preferred alternative during design and wetlands permitting.

Comment: In Section 8 (page 8-1), FDOT indicates that wetland impacts will be mitigated using either Florida statute approved mitigation (373.4137 F.S.), mitigation banks, or property donations. The Service recommends developing a mitigation plan at the earliest time conceivable well in advance of the wetland dredge-and-fill permit application. A carefully-considered mitigation plan can be a valuable tool toward offsetting unavoidable wetland losses, meeting conservation goals, preventing "missed opportunities", and proactively addressing the threats of future secondary and cumulative growth.

We encourage taking a holistic approach to mitigation planning for the GCP that balances transportation needs, conservation priorities, and growth management concerns. Due to the potential for this new roadway to highly alter the surrounding landscape, mitigation for impacts should be strategically-located to protect important water/wetland resources and help achieve regional conservation objectives. A landscape planning effort using tools such as Strategic Conservation Planning Using a Green Infrastructure Approach, Sector Planning, or a Regional general Permit would assist in identifying conservation priorities while providing a mechanism to direct growth away from key resources at-risk. In November 2010, the Service hosted a local training on Green Infrastructure to familiarize our partners with its principles. The Service is available to work with FDOT and FHWA toward developing and implementing a regional Green Infrastructure Plan for the project area.

Response: Agreed.

Comment: Measures to reduce the GCP's direct and indirect effects to wetlands (and the fish, wildlife, and plant resources they support) should be provided once a preferred alternative is determined. These commitments should include: environmentally-sensitive bridging of waters and high quality resources; protecting riparian corridors along Wetappo Creek and Little Sandy Creek to maintain connectivity between two population of the red-cockaded woodpecker; acquisition and restoration of habitat for the PCC; reducing the project footprint in high quality habitat; stringent limited access; avoiding imperiled plant species in the Florida panhandle; provide wildlife crossings to reduce habitat fragmentation for the Florida black bear and other wide-ranging species; an erosion control plan to prevent degradation of downstream waters; water quality protection measures; post-project monitoring to identify and control invasive and exotic species; and measures to reduce impacts to migratory birds.

Response: WER Section 8 (Avoidance, Minimization, Mitigation, and Commitments) currently states: "Avoidance and minimization of potential wetland and surface water involvement was central to both corridor and alignment development. Direct involvement with wetlands and surface waters (creeks, streams, ditches) will occur as a result of roadway construction activities.

Recognizing this, efforts have been made throughout the Project Development and Environment (PD&E) process via desktop analyses and subsequent field surveys to identify routes that may result in fewer wetland impacts – especially those potentially involving higher quality wetlands. During the project design phase, jurisdictional wetlands will be field-delineated resulting in a more detailed assessment of wetland involvement (quantity and quality) for the Recommended Alternative. These detailed field assessments may facilitate further reductions in potential wetland involvement through minor shifts of the Recommended Alternative, if practicable. Direct and indirect wetland impacts will be minimized through appropriate stormwater design, and utilization of Best Management Practices (BMPs) at wetland, bay, and stream crossings (especially East Bay and Wetappo Creek) during construction.”

In keeping with the format utilized in other PD&E documents, additional commitments have been included in the updated ESBAR Sections 8 (Determination of Effect) and 10.2 (Conservation Measures and Commitments). If warranted and practicable, additional measures identified by USFWS (and discussed below) will be addressed during project design and wetland permitting to reduce direct and indirect effects to wetlands and associated plants and animals for the preferred/recommended alternative.

- environmentally-sensitive bridging of waters and high quality resources: updated in ESBAR;
- protecting riparian corridors along Wetappo Creek and Little Sandy Creek to maintain connectivity between two populations of the red-cockaded woodpecker: updated in ESBAR;
- acquisition and restoration of PCC habitat: discussed in ESBAR. The referenced management plan for this state listed species of special concern is still a draft. Any potential mitigation requirements or a state-issued incidental take permit will be addressed by the project sponsor and FWC during design and permitting. According to FFWCC website (accessed on October 16, 2012, <http://myfwc.com/wildlifehabitats/imperiled/listing-process/>) the draft management plan of the Panama City crayfish will be finalized by spring 2013. Based on this information and the status of the species, FDOT still concludes that this project MANLAA the PCC.
- reducing the project footprint in high quality habitat: standard practice during PD&E process; considered further for the preferred alternative during design/permitting
- stringent limited access: not appropriate for this project given its purpose and need;
- avoiding imperiled plants, including areas identified by TNC and FNAI (21 most imperiled plant species in the Florida panhandle): addressed in ESBAR; see response to Comment 9 ICE.
- provide wildlife crossings to reduce habitat fragmentation for the Florida black bear and other wide-ranging species: addressed in ESBAR;
- an erosion control plan to prevent degradation of downstream waters: commitments have been added to ESBAR;
- water quality protection measures: commitments have been added to ESBAR;
- post-project monitoring to identify and control invasive and exotic species: No specific plan is needed at this time. FDOT has a ROW maintenance program that encourages native plant diversity and habitat connectivity. FDOT also has a program that considers the management/control of invasive/exotic species
<http://www.dot.state.fl.us/statemaintenanceoffice/invasivespecies.shtml>

- measures to reduce impacts to migratory birds: No rookeries were observed or identified in public databases. Listed migratory birds were fully considered in the ESBAR and, along with un-listed migratory birds, were considered to be transient.

Comment: The Wetlands Action Plan indicated there would be agency coordination throughout the PD&E process. As indicated in Section 9, no coordination has taken place with the Service to discuss and resolve wetland concerns since 2007. We recommend periodic meetings to further progress toward resolving the Potential Dispute.

Response: Further coordination with the USFWS is planned to be conducted following the public hearing and prior to recommendation of a preferred alternative.

Indirect and Cumulative Effects Report

Comment: Table 5-18 indicates that 60.6% of the Potentially Affected Resource Area (PARA) for Water Quality is verified impaired waters. How was this calculation made, as only one basin (East Bay) in the referenced Florida Department of Environmental Protection 2006 Water Quality Assessment Report is identified as verified impaired? As Class II shellfish waters, this water body was determined to be verified impaired for fecal coliforms.

Response: Since this report was prepared, the FDEP has published revisions to their lists of impaired waters as result of the second rotation of water quality assessment. Therefore, this table has been revised.

The calculation of the area of verified impaired waters within the PARA was made by calculating the area of verified impaired waters that fell within the PARA boundary and dividing by the total area of the PARA.

Based on FDEP's data published after the second rotation of water quality assessment, East Bay is verified impaired for bacteria (in shellfish) and mercury (in fish tissue).

Comment: The report suggests that future development may provide beneficial effects to water quality in impaired basins through improved stormwater management. Additional support should be provided for this statement. Generally, stormwater treatment is designed to mitigate the effects of new development and does not provide overall watershed improvement, unless existing systems are being retrofitted.

Response: The statement has been removed.

Comment: Other metrics may be available to better identify potential future effects to water quality in the PARA. For example, studies have shown that water quality degradation can begin with as little as 10% impervious surface in a watershed (Schueler 1994; Schueler and Holland 2000; Arnold and Gibbons 1996). Determining the percent impervious surface of predicted future development within individual water bodies in the PARA may be a more useful tool in determining which water bodies are at-risk of future water quality degradation as an indirect and cumulative effect of the GCP.

Response: Since there are no development plans for the forecasted future developments only a general estimate of future impervious cover could be calculated. These calculations were made for the study area as a whole and by drainage basin.

Comment: The Delphi Group has indicated that none of the forecasted new coastal growth is associated with the Build Alternatives. It seems likely that the GCP - as a new coastal connector road - will have some degree of effect on coastal growth.

Response: The Delphi Group indicated that the on-going and known planned developments would accommodate the projected population in the coastal area within the study period. The discussion has been revised to include additional information for the basis of no increase in population projections in the coastal area during the study period. These include the schedule for the project's construction and the study area's competition with west Bay County for any population migrating into the County.

Please note, that there was some increased development in the coastal area associated with the alternatives. This development was mostly office/commercial type development; however, there was a residential component. The residential component was not the result of migration from outside the study area but due to the allocation of projected population to this area due to the presence of the project. Also, on the assumption that the coastal area would eventually develop similar to other coastal areas of the Panhandle, some of the residential component would be in the form of condominiums which have a much smaller footprint than subdivision type development and would likely occur where existing single-family homes are purchased by investors for redevelopment. Certainly redevelopment would need to occur for the area to be competitive with the Panama City Beach area.

Comment: Page 4-33 indicates that any commensal species, including the Eastern indigo snake, captured during gopher tortoise relocation efforts, must be relocated to a certified gopher tortoise recipient site. The Service recommends that you first follow *Eastern Indigo Snake Standard Construction Conditions* and allow the snake sufficient time to move out of the construction area. If the snake must be moved, only personnel authorized under a U.S. Fish and Wildlife Service Section 10 permit may handle this federally protected species. A state gopher tortoise permit does not provide authorization for moving the Eastern indigo snake.

Response: Agreed. All necessary permits will be sought per the federal Endangered Species Act. Language in WER, ESBAR, ICE Report, and DEIS for this section will be modified accordingly. Commitments have been updated in the ESBAR and WER, as necessary.

Comment: For the Florida black bear, the Service's greatest concern is the fragmentation of its habitat by a new future four-lane roadway. If the road becomes a barrier to movement, it could eliminate access to habitat. For example, bears in the Apalachicola population could lose all suitable habitat to the west of the road. Measures to offset fragmentation should be identified in the report. These measures may include construction of wildlife crossings, reducing speed limits, prioritizing corridors that reduce east-west habitat fragmentation, and/or minimizing the overall footprint in high quality habitat areas.

Response: The Florida black bear is a state-listed species protected by the FFWCC. The analysis of indirect and cumulative effects on the black bear was coordinated with the FFWCC and the Agency Advisory Group prior to conducting the analysis. The direct and indirect (non-induced growth effects of the project alternatives and measures for offsetting impacts (including consideration of wildlife crossings) have been addressed in the ESBAR and the Wildlife and Habitat sections of the DEIS. The ICE analysis, while including the project's quantifiable direct effects and indirect effects and acknowledging unquantifiable indirect effects, is primarily focused on the quantifiable induced growth effects of the project and the effects of the reasonably foreseeable future actions of others.

Please note that the habitat connectivity section of the Final Florida Black Bear Management Plan (approved June 27, 2012) no longer specifically identifies a corridor for east-west movement between the Eglin population and the Apalachicola National Forest population. It does recommend promoting landscape connectivity from the East Panhandle BMU to the Econfina Creek Water Management Area.

Comment: On page 4-47, habitat for the red-cockaded woodpecker (RCW) is prioritized by nesting habitat (highest), foraging habitat, and a flight/dispersal corridor between the two known tracts (lowest). All these habitat types are priorities for the Panama City Field Office, and should be identified by function rather than an assigned relative importance. Measures to offset impacts to the flight corridor could include protection/management of suitable habitat within the corridor. Another potential secondary effect of the GCP is a reduced ability to manage existing RCW tracts by prescribed burning due to smoke management concerns. Other secondary effects in addition to new growth should be discussed in the report.

Response: The analysis of RCW habitat was performed in accordance with the directions provided by Agency Advisory Group (on which the Service had a representative), and included input from the FFWCC. There are no secondary effects of the project on the RCW, except for the potential induced growth effects discussed in the ICE Report, due to the distance of the alternatives from the RCW colonies' nesting and foraging habitats. The FHWA and FDOT are not required to offset induced growth or cumulative effects; however, the text will be revised in the section on mitigation opportunities to note that the management or conservation of suitable habitat within the potential RCW flight corridor would be consistent with the Service's goal to protect potential flight/dispersal corridors and that it should be a priority for preservation.

Comment: The RCW PARA should be the same as the Wildlife PARA, as RCW may potentially occur wherever suitable habitat is present and not just within known tracts.

Response: The PARA for the red-cockaded woodpecker was established with the ICE Agency Advisory Group and, therefore, will not be changed. Further, the identification of the locations of RCW populations, as well as those for any other federally-listed species, is limited to that which is available via public sources/websites. Considerations beyond that would be based on an inappropriate and misleading premise that RCW nesting habitat exists because pine-dominated forests exist. Furthermore, given RCW life history traits and foraging territory boundaries, there would be no involvement by the project on any level outside of the 0.5 mile foraging territory boundary per active cluster. All alternatives for this project are outside the foraging territory boundaries for the only known RCW populations within the project area (Wetappo Creek and Lathrop Bayou).

Comment: Page 4-50 refers to a single 59-acre site for the "21 most imperiled species". It is unclear what site the document is referencing. The Service provided information to Greg Garrett, PBS&J, in a note dated October 16, 2009, on a 2001 report by The Nature Conservancy and Florida Natural Areas Inventory that identified areas important to the survival of the 21 most imperiled plant species in the Florida panhandle. A copy of the report and a geographic information system (GIS) shapefile were also provided at that time. Several of these important plant areas occur in the study area, including: Ridges of Gulf County (9,825 acres); Wetappo Creek South (3,543 acres), and Sandy Creek Bogs (6,998 acres). The Indirect and Cumulative Effects Report should be updated to accurately assess potential effects to the "21 most imperiled plant species".

Response: The ICE Report has been revised to include the missing information.

A 2001 report by The Nature Conservancy (TNC) and Florida Natural Areas Inventory (FNAI) identified 21 plant species in northwest Florida, that in their opinion, are in need of protection due to being rare and in danger of being extirpated due to being on private lands. Shapefiles were provided with the report that identified three areas on private lands in the study area that support rare communities including: Ridges of Gulf County (9,825 acres); Wetappo Creek South (3,543 acres), and Sandy Creek Bogs (6,998 acres). As described in the ESBAR, the initial desktop evaluation included data from the most current FNAI report (2007) for the area. As the PD&E study progressed and field surveys were conducted across various alignments, proposed alignment footprints changed several times to address a variety of different potential impacts including those to listed species actually observed in the field. The results of the data synthesis and field reconnaissance indicated that listed plant species occurrences within the respective alignments and buffers and potential involvement was minimal.

The above referenced areas harboring rare plant communities were avoided to the greatest extent practicable during the PD&E stage of this project. The Ridges of Gulf County has been completely avoided. The majority of potential involvement with Sandy Creek Bogs and Wetappo Creek South are associated with existing paved highways, SR 22 and CR 386, respectively. Of the "21 most imperiled species" identified by FNAI and TNC, only 4 species are located within the "3 Rare Plant Areas" and 3 of these species are state listed (*Aster spinulosus* – currently *Eurybia spinulosus*, *Eriocaulon nigrobactatum*, and *Xyris isoetifolia*). The only federally-listed plant is Florida skullcap, which is found 4 miles east of Alternative Alignment 8/14/15. The "TNC-FNAI 21 species report" was developed at a coarse scale for the entire panhandle (Jefferson County to Alabama). Surveys conducted by project biologists were more current and thorough, as was the project-specific FNAI Report.

As is the case with all FDOT projects, listed species and even rare (un-listed species) will be avoided and impacts minimized to the extent practicable. Depending on the alternative selected it is possible that there may be very minimal involvement with the areas identified as having rare species. Once a preferred alternative is selected supplemental seasonal surveys are anticipated to determine accurate and current impacts to listed species.

Comment: Page 4-43 indicates that since the Florida Fish and Wildlife Conservation Commission (FWC) and Service are working on a Candidate Conservation Agreement with Assurances (CCAA) with a major private landowner to protect habitat for the Panama City crayfish (PCC) "it is assumed that a core population of PCC will be managed in perpetuity... Therefore, any induced development...was determined not to have a substantial adverse effect on the PCC". The intent of the CCAA, which has yet to be finalized, is to provide sufficient habitat to offset direct losses from projects sponsored by the landowner. Under the Build Alternative, the potential for 124.3 acres direct and 1,329 to 1,774 acres indirect loss of PCC habitat could have a substantial impact on the PCC. The Service is concerned that cumulative effects could impact up to 26.7 % of PCC habitat. The report should include commitments to address potential habitat loss consistent with the draft 2007 Panama City Crayfish Management Plan during the FWC incidental take permitting process.

Response: One purpose of the ICE analysis is to identify any threat to the survival of sensitive resources and recommend measures that can be taken (by someone other than the project's proponent) to offset the predicted adverse effects. The report has done that. Commitments are not part

of an Indirect and Cumulative Effects analysis as the FDOT and FHWA are not required to mitigate for the impacts of induced development or the future actions by others.

Comment: On page 6-1, the list of Past, Present, and Reasonable Foreseeable Actions should also include: Gulf-to-Bay Highway Segments 1,2, and 3; St. Joe Company WindMark Phase I and future phases; St. Joe Company RiverCamp on Sandy Creek; Biomass Gas and Electric Biofuels Facility; Port St. Joe port expansion; Bay Industrial Park; St. Joe Company Bonfire Beach; Deer Point Elementary School; Creekside Partners LLC; St. Joe Company The Landing at Wetappo Creek; and Sweetwater Mitigation Bank.

Response: The list will be revised to include most of the projects identified in the comment. Unless the Service can provide information on locations and dimensions of RiverCamp on Sandy Creek and Creekside Partners LLC within the study area, they cannot be included. The Biomass Gas and Electric Biofuels Facility, Deer Point Elementary School and Port St. Joe expansions are thought to be located beyond the boundaries of the PARA.

Draft Environmental Impact Statement

Comment: Comments provided by Service on the ESBA, Wetlands Evaluation Report, and Indirect and Cumulative Effects Report should be addressed in final EIS (FEIS). Conservation measures and commitments should be provided to avoid and minimize impacts to federally protected and other rare species, and their habitats consistent with recommendations of the Service.

Response: Agreed. Updates to referenced documents will be made as necessary.

Sincerely,



Alan Vann